

Socio - Economic Survey Under the National

Silk Project in Saharanpur and Dehradun Districts of Uttar Pradesh and Solan District of Himachal Pradesh

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Ministry of Textiles

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SECTOR 'O' ALIGANJ HOUSING SCHEME

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**SOCIO-ECONOMIC SURVEY UNDER THE NATIONAL
SILK PROJECT IN SAHARANPUR AND DEHRADUN
DISTRICTS OF UTTAR PRADESH AND SOLAN
DISTRICT OF HIMACHAL PRADESH**

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PREFACE

Income and employment potential from non-farm sector has been a subject of intense study among economists and other social scientists since the inception of Indian economic planning. This is accompanied with India's industrialisation development strategy, which has emphasised the income and employment by pursuing the organised and unorganised sector development in urban centres and non-farm household sector in rural hinterland. It theoretically presumes that all sectors and sub-sectors of Indian economy would work on 'complementary' rather than 'competitive' basis and, therefore, growth generated by one sector would stimulate the growth of other, thus resulting ultimately into the higher income and employment. Such a strategy, however, did not work very well. Studies carried out earlier suggested the poor linkages among the urban or rural industrial sectors and sub-sectors. Over time, it has gradually been realised that such an approach would not be of vital significance from the view point of income and employment generation. This is because organised and unorganised sectors in urban centres have limited capacity to generate income and employment owing to their inbuilt structural constraints. Attempts, have

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therefore, been made to stimulate the growth of non-farm household sector, in which Sericulture activity receives a high priority.

Sericulture is basically a seasonal household activity. It utilises family labour and generates additional income to the lively hood of rural households. Thus, sericulture helps in overcoming endemic poverty and cronic unemployment in rural areas. However, our knowledge about the income and employment generating potential from sericulture is scanty and inadequate. Any systematic study on sericulture would fill an important gap on our knowledge. Present study 'Socio-Economic Survey Under the National Silk Project of Sericulturists and Non-Sericulturists in Saharanpur and Dehradun of Uttar Pradesh and Solan of Himachal Pradesh' is a modest attempt towards this direction.

Based on the sample of sericulturist households in Dehadun and total enumeration in Saharanpur and Solan, study examines certain important aspects of sericulture activity. In particular, study analyses and examines the general characteristics of households engaged in it and generates the base line data for employment, income, cocoon production and area under mulberry cultivation. It also examines the level

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of land, labour, capital and input productivities across the districts. Besides, study also examines the various problems faced by sericulturists in terms of production and marketing of cocoons and highlights the main reasons for not increasing the area under mulberry cultivation. It also examines the problems faced by non-sericulturists as well for not starting the sericulture activity. The contribution of women in sericulture also forms an important part of the present study.

Present study received invaluable help, support and cooperation from many individuals from its inception to its present form. At the outset, we would like to accord our appreciation and gratitude to all those sericulturists and non-sericulturists, who provided the relevant information required for the study. Also, we are thankful to the staff members of various Training Service Centres (TSCs) located in Dehradun, Saharanpur and Solan. We are also thankful to staff members of the Directorate of Sericulture, Government of U.P. for providing relevant information and extending support required for the study.

Prof. G.P. Mishra, Acting Director of Giri Institute of Development Studies, provided all administrative and infrastructural support and encouraged to complete the study.

Dr. M.S. Ashraf, extended all helps and cooperation wholeheartedly at the final stage of the study. We feel extremely grateful to all these colleagues.

We received valuable help and cooperation from the research team consisting of Mr. D.S. Nagarkoti, Mr. K.S. Deoli, Mr. Mohd. Kaleem, Dr. A.K. Singh, Mr. S.K. Trivedi, Mr. A.K. Tripathi and Mr. R.K. Srivastava who helped wholeheartedly during the field investigation of the project. Dr. Neerja Mishra, Dr. Lallan Dubey, Dr. Rajesh Shukla, Mr. Mohd. Asif Siddiqui, Km. Hemlata, Km. Tara Devi and Rajni Gandha helped at the final stage of the project. We feel extremely thankful to all of them.

Outside of the institute, we have been benefitted immensely from the discussion held with Prof. T. Maitra, Indian Statistical Institute, Calcutta, who enlightened certain methodological problems of sericulture activity.

We will be failing in our duty if we do not express our sincere thanks to the library, secretarial and administrative staff of Giri Institute of Development Studies, who rendered invaluable supports required for the study at various stages. Specially, we acknowledge our sincere thanks to Miss. Ishrat Husnain, who processed data on computer and Mr. Devanand S., who word processed the manuscript timely and efficiently.

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Needless to mention, the present study is an outcome of goodwill, support and suggestions we enjoyed from all these sources. We are, however, alone responsible for all the errors and omissions remained in the present study.

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November 5, 1996

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CHAPTER - I

INTRODUCTION: FRAMEWORK OF THE STUDY

I. Introduction

Non-Farm activities have generally been recognised as an important strategy for rural development in terms of generation of income and employment. This is so because agricultural sector as such is not able to generate additional employment due to high population pressure on land and that in the urban areas additional employment generation is limited due to high growth of city's own population and the influx of migrants from rural to urban areas. Opinion, however, differs. It is viewed that employment may be generated in the agricultural sector under the assumption that technical change must take place in this sector.¹ However, it has also been argued that adoption and realisation of technical progress in agriculture does not itself ensure the generation of employment in the land-scarce economy.² This is because certain inherent forces like 'egalitarian distribution of land holdings' and practice to avoid hiring workers due to technological changes come to play a retrogressive role for employment generation in the agricultural sector.

The emphasis has, therefore, been placed on the agriculture linked activities. Such a strategy in India is compatible with rural development through various ways : First is the 'spatial diversification of industries; " in which case it may be treated as part of the problem of the location of industries. It may be argued that a spatial concentration of industries in large urban centres is not conducive to an equitable pattern of growth, and that, therefore, industries should be spatially diversified into smaller towns, backward areas and villages."³ As it is, this approach implies the growth of non-farm activities, which is compatible with the existing factor endowment structure of the rural hinterland. Such an approach, howsoever economically viable it is, is not without limitations. Certain disincentives, such as, absence of economies of scale and agglomeration economies and lack of infrastructure and incentives, which are otherwise available in urban areas, come to discourage the spatial⁴ diversification of industries.

Second, non-farm activities have also been looked "as a process confined to the development of village industries. "Village industries predominantly in the form of traditional crafts have engaged a part of population for centuries. Over the years, many of them seem to have languished for various reasons, including decline in patronage, static technology, competition from substitutes produced in the modern urban

industries sector and low income elasticity of demand"⁵. This approach, which describes the development of resource based traditional crafts, seems to be incompatible for rapid rural development, due to inefficient marketing network and out dated technology.

As a compromise to the above approaches, a third approach called as 'integrated rural development' has been evolved.⁶ This approach describes the rural development as an outcome of inter-sectoral, inter-product and technological relationships between the urban industrial sector and village industries as has been stated: "In order that this industrial spectrum in terms of output, organisations and locations may lead to an increasing integration between the different sectors, it is essential that constant improvement takes place in the technology of traditional rural industries and that modern consumer goods and light capital goods industries use technologies which are linked not only with the advanced technology used by heavy capital goods industry but also with the improved traditional technology used by village industries."⁷ This approach implies the interrelationship between modern industrial sector and the modern rural sector, which would ultimately lead to rural development.

The above approaches emphasising the equitable pattern of growth, employment generation and integration between modern urban industrial sector and modern rural sector ultimately aim to rural development. This could be made

possible provided various constraints emanating from internal supply and to that on external demand are overcome and that advantages arising on account of cheap labour especially in terms of surplus unskilled labour are optimally utilised. In doing so, it is essential to identify the productive employment generating rural activities and to understand their entire functioning through appropriately designed research studies. However, non availability of information base poses a crucial problem. What are the agriculture linked specific activities possessing productive employment generating potential in which unused household labour hour would be utilised? What amount of income can be generated in such specific agriculture linked activities? And what problems such activities are facing in production and marketing of their products? The appropriate answers of these questions could satisfactorily be provided by undertaking the suitable research study in a fresh dimension.

National Silk Project identified sericulture as an important rural activity through pilot projects in 12 non-traditional mulberry, states which also includes Uttar Pradesh and Himanchal Pradesh. In these states NSP proposed to undertake a socio-economic survey for sericulturists and non-sericulturists. Socio-economic survey aims at generating the base-line data for the areas in which the National Silk project is being implemented. It will, therefore, concentrate on a few areas under mulberry cultivation, production of cocoon and estimation of income, productivity,

participation by different members of the family, especially women in sericulture and the share of income accruing to them at the district level. Besides the base line data generation, the study would also identify and examine the various socio-cultural factors contributing to sericulture activity and the problems faced by it in marketing of cocoon, silk, etc. adopted by households engaged in sericulture.

II. Objectives of the Study

The present study aims at examining the following objectives specifically:

- i) Making reliable estimates of the total acreage under mulberry and production of cocoon at the district level;
- ii) Estimating income from and productivity of land, labour and capital in sericulture activities;
- iii) Estimating total employment in sericulture and the employment potential in sericulture in the selected districts;
- (iv) Determining the nature and kinds of participation of different members of the family, especially women, in sericulture;

- (v) Estimating, as far as possible, the share of income accruing to different members of the family, especially women, from sericulture;
- (vi) Understanding women's perception of their own role in and contribution to sericulture activities at the household level;
- (vii) Identifying and analysing any social/cultural factors which have a bearing on sericulture and its adoption by the moral households;
- (viii) Identifying the mechanism of marketing of products (cocoon, silk etc) adapted by the households engaged in sericulture; and
- (ix) To suggest certain specific policy measures to enhance sericulture activity and the productive employment to those engaged in sericulture at the district level.

III. Sericulture : An Overview

History of sericulture activity is century old. In the early phase of century (301), Japan was the largest silk producer in the World, which accounted for 70 percent of world's total silk production. However, since mid 70s the silk production in Japan fell down steadily, which was gradually taken over by China. In 1992, China produced over 54,500 MT of silk, while Japan produced only 5085 MT. Similarly, silk production in South Korea also witnessed

deceleration from 1680 MT in 1986 to 1200 MT in 1993. Silk production of erstwhile Soviet Union, Thailand and Brazil was found to be 4000 MT, 1700 MT and 2326 MT in 1993 respectively. Silk production in India increased moderately from 7905 MT in 1986 to 13418 M.T. in 1993. Thus, India came up as the second largest producer of silk which accounted for 13.29 per cent of world silk production after China which accounted for 71.16 per cent of the world silk production.⁸

In India, there are four commercial silk worm varieties viz. mulberry, tasar, eri and muga. In 1993-94, India produced 92.2 per cent of mulberry silk, while only 2 per cent of tasar. Mulberry is chiefly produced in five traditional states, like, Karnataka, Andhra Pradesh, Tamil Nadu, West Bengal and Jammu and Kashmir, while tasar is mainly produced in Bihar, Madhya Pradesh, Maharashtra, Orissa and Andhra Pradesh. The production of eri silk was about 771 MT in 1993-94 being 5.3 per cent of the total silk produced in Northern Bihar and North Eastern States. The Production of muga silk is only 76 MT accounting for nearly 0.5 per cent of the country's total silk production. Due to humid climate, it is chiefly produced in Assam and North Eastern States.⁹

Owing to heavy demand of mulberry silk for the production of sarees and grey fabrics, the mulberry silk has now been gradually increasing and spreading in many non-traditional states, like, Rajasthan, Gujarat, Uttar Pradesh, Bihar, Orissa, Assam, Kerala, Himachal Pradesh, Madhya

Pradesh and others. However, among all states, Kerala, Andhra Pradesh, Tamil Nadu and West Bengal accounted for 60 per cent, 21.3 per cent, 8.2 per cent and 7.6 per cent of India's total raw silk production in 1993-94¹⁰. The Contribution of U.P. was only 0.18 percent in country's total raw silk production in 1990-91.¹¹

Sericulture activity is also highly export oriented. Export earnings from sericulture/silk industry increased from Rs.7.59 crores in 1971-72 to Rs.440.53 crores in 1990-91. The share of export earnings from sericulture/silk in India's total export increased from 0.47 per cent in 1971-72 to 1.35 per cent in 1990-91. In current years, India is seen facing stiff competition in the World silk trade "due to vigorous production and sale of silk fabric garments by China. Improvements in the quality of silk fabrics and diversification of silk products are essential to make a dent in the international silk trading."¹² Sericulture/silk industry is also highly employment generating activity. A large part of down trodden people (SC/ST) and women are found engaged in sericulture activity. It employed 10.31 lakhs of persons during 1986-87 to 1989-90, of which 2.69 lakhs persons were from SC and ST, which accounted for 26.02 per cent of employment engaged in sericulture. According to one estimate, sericulture provides direct employment to 18.97 lakhs in mulberry, 0.73 lakhs in tasar, 0.28 lakh in eri and 0.20 lakh in muga, while indirect employment has been reported to be 6.26 lakhs, 0.24 lakhs, 0.09 lakh and 0.07

lakh respectively. Thus, total direct and indirect employment was worked out to be 26.83 lakhs in 1985-86 in India.¹³

IV. Methodology and Data Base

VI.1 Dehradun District:

So as to examine the objectives per-se, Dehradun and Saharanpur districts have been selected from the state of Uttar Pradesh and Solan from Himachal Pradesh. Dehradun has the largest area under mulberry cultivation and is the largest producer of cocoon as compared to rest of districts in U.P. Doon Valley is endowed with climatic conditions conducive to the growth of sericulture. The district has been the forrunner in sericulture activity in the state. The first reeling unit in the state was also established at Dehradun in private sector. Currently, both private farms and government farms are developing the sericulture activity. Dehradun is major mulberry cocoon producer, which consists of Bivoltine cocoon and multivoltine cocoon. Bivoltine cocoon dominates in Dehradun district.

We may now discuss the sampling procedure for selection of sericulturists and non-sericulturists in Dehradun. We, followed a three stage purposive sampling procedures. In Dehradun, out of 6 blocks, four blocks, namely Vikasnagar,

Sahaspur, Doiwala and Raipur were found engaged in sericulture activities. On the basis of information provided by various Technical Service Centres, Vikasnagar has the largest area under mulberry cultivation, being 324.06 acres, followed by Sahaspur 199.48 acres, Doiwala 111.52 acres and Raipur 40.65 acres. The number of villages carrying out sericulture activities were found to be 59 in Sahaspur, 53 in Doiwala, 46 in Vikas Nagar and 18 in Raipur. Similarly, number of sericulturists was reported to be 1233 in Vikasnagar, 523 in Sahaspur, 240 in Doiwala and 67 in Raipur (Table-I.1). Thus, considering the significance of sericulture activities, at the first stage, all 4 blocks were selected while two non-sericulture producing blocks are left out in Dehradun district.

Table I.1 : Selection of Blocks in Dehradun

Blocks	Area Under mulberry (Acres)	Sericul- ture villages (Nos.)	Sericul- turists (Nos.)
1. Vikas Nagar	324.06	46	1233
2. Sahaspur	199.48	59	523
3. Doiwala	111.52	53	240
4. Raipur	40.65	18	67
Total	675.71	176	2063

Source : Technical Service Centres, National Sericulture Project, Central Silk Board, Dehradun, U.P.

At the second stage of sampling, two villages from each block have been selected on the basis of area under mulberry based on the purposive sampling method. Badripur and Judly from Vikasnagar, Baronwala and Nayagaon from Sahaspur, Jolly grant and Ballawala from Doiwala and Barasi and Navada from Raipur have been selected (Table-I.2). For selecting the sericulturists and non-sericulturists from sampled villages, we classified sericulturists and non-sericulturists into 4 land size classes, such as, (I) < 1.0 acres, (II) 1 to < 2.00 acres, (III) 2.00 to < 4.00 acres and (IV) > 4 acres.

Table 1.2 : Selection of Villages from the Blocks

Blocks	Villages Selected on the basis of area under mulberry cultivation
1. Vikas Nagar	1. Badripur 2. Judly
2. Sahaspur	1. Baronwala 2. Nayagaon
3. Doiwala	1. Jolly Grant 2. Ballawala
4. Raipur	1. Barasi 2. Navada
Total 4	8

Source : Technical Service Centres, National Sericulture Project, Central Silk Board, Dehradun, U.P.

At the third stage of sampling, following the similar methodology, 8 sericulturists and 2 non-sericulturists were selected in each villages from 4 land size classes randomly. In all, 64 sericulturists and 16 non-sericulturists were selected from the 4 blocks and 8 villages from the Dehradun district.

VI.2 Saharanpur District

We may now come to discuss the procedure of selection of sericulturist and non-sericulturist households in Saharanpur district of U.P. Based on the information collected from Technical Service Centres, it was found that there were 9 blocks in the district where sericulture activity was being carried out. These blocks were (1) Deoband, (2) Nakur, (3) Punwarka, (4) Muzzaffarabad, (5) Nagal, (6) Sadhauri Kadeem, (7) Balea Khedi, (8) Nanauta and (9) Rampur Maniharan. In these blocks, the number of farmers engaged in sericulture activity were 321, acreage under mulberry 234.51 acres and sericulture villages were 90.

Following the multistage purposive sampling method, out of 9 blocks, 4 blocks were selected on the basis of area under mulberry. Thus, at the first stage of sampling, we selected 4 blocks namely, (1) Punwarka, (2) Nakur, (3) Deoband and (4) Muzzaffarabad (Table - I.3). At the second stage of sampling, 2 villages from each block were selected on the basis of acreage under mulberry. Thus, Gyangarh and

Table I.3 : Selection of Blocks in Saharanpur District

Blocks	Area under mulberry (Acres)	Sericulturists (Nos.)	Sericulture Villages (Nos.)
1. Deoband	40.47	68	31
2. Nakur	41.14	51	11
3. Punwarka	44.15	45	15
4. Muzzaffarabad	35.79	51	14
5. Nagal	34.96	63	12
6. Sadhauri Kadeem	17.20	19	8
7. Balea Khedi	10.50	12	4
8. Nanauta	5.30	7	2
9. Rampur Maniharan	5.00	5	1
Total	234.51	321	90

Source : Technical Service Centres, Central Silk Board, Saharanpur

Devla from Punwarka; Tabar and Kutubpur from Nakur; Rastom and Nihal Khedi from Deoband and Tota Tanda and Jewla from Muzzaffarabad had been selected for drawing the sample of sericulturists and non-sericulturists (Table I.4). At the third stage of sampling, 8 sericulturists and 2 non-sericulturists were selected randomly from each village from the land holding sizes similarly as discussed in the case of Dehradun.

Table I.4 : Selection of Villages in Saharanpur

Name of the Block selected on the basis of area under mulberry	Villages selected (Nos.)	Name of the villages selected on the basis of area under mulberry
1. Punvarka	2	1. Gyangarh 2. Devla
2. Nakur	2	1. Tabar 2. Kutubpur
3. Deoband	2	1. Rastom 2. Nihal Khedi
4. Muzzaferabad	2	1. Tota Tanda 2. Jewla
Total = 4	8	8

Source : Technical Service Centres, Central Silk Board, Saharanpur.

It may, however, be mentioned that at the time of actual field survey, it was found that intended sample of sericulturists (64) was more than the existing sericulturists in Saharanpur (63). In view of this, a census method was followed in case of Saharanpur district.

IV.2 Solan District

As far as sampling procedure in solan district of Himachal Pradesh is concerned, we followed a similar

methodology as in the case of Saharanpur. According to the information provided by the Technical Service Centres, there were two blocks viz., Nalagarh and Dharampur, where sericulture activity was being carried out. The number of sericulturist households were 141 in Nalagarh, while 69 in Dharampur. In all, the number of sericulturist households were 210. The total acreage under mulberry was 59 acres in Nalagarh, while 44.70 acres in Dharampur. Taking together, total acreage under mulberry was found to be 103.70 acres in Solan district. (Table I.5).

Table I.5 : Blocks, Villages, Sericulturists and Area Under Mulberry Cultivation

Name of Block	Villages (Nos.)	Sericulturists (Nos.)	Area under mulberry (Acres)
Nalagarh	40	141	59.00
Dharampur	30	69	44.70
Total	70	210	103.70

Source : Technical Service Centres, Barotiwala and Nalagarh, Central Silk board.

At the first stage of sampling, Nalagarh and Dharampur blocks had been selected for drawing the sample of villages (Table I.5). At the second stage of sampling, 2 villages from each block were selected. These are Karsauli and Dalchham from Nalagarh and Pattamehlog and Thedpura from Dharampur. (Table I.6). At the third stage of sampling, 8

Table I.6 : Selection of Non-Sericulturists from Sampled Villages in Solan District

Blocks	Villages (Nos.)	Selected Villages (Nos.)	Name of the Selected villages	Non-sericul- turists selected (Nos.)
Nalagarh	40	2	1. Karsauli 2. Dalchham	8 8
Dharampur	30	2	1. Pattamehlog 2. Thedpura	8 8
Total	70	4	4	32

Source : Technical Service Centres, Barotiwala and Nalagarh, Central Silk Board, Himachal Pradesh.

sericulturist and 2 non-sericulturist households from each village were selected randomly from 4 land holding sizes similarly as in the case of Dehradun and Saharanpur districts. It was, however observed during the field inquiry that the sample of sericulturist households proposed to be surveyed was only 32, which was not in consistent with Saharapur (63) and Dehradun (64). Considering this, we covered all sericulturist households (80) in Solan. Thus, in case of Solan, also a census method was followed. In all, 80 sericulturist and 32 non-sericulturist households were surveyed to examine their socio-economic conditions.

Two sets of questionnaires one for sericulturist and other for non-sericulturist on the line of ISI, Calcutta with appropriate modifications were designed to examine the

objectives. The year for the survey relates to 1992-93 and 1993-94. Since mulberry is normally grown during early spring, late spring, early autumn and late autumn seasons, the field work took place into two phases (i) from first week of February to the last week of May (ii) from second week of September to the second week of December. It may be noted that before going to the field for filling up the questionnaires, field staffs were given proper training in the Institute and thereafter, they were stationed at different Technical Service Centres in mulberry growing villages. This was deemed essential because weekly visits to the field were required for understanding the various stages of cocoon production at mulberry growing centres. Thus, continuous and reliable checking was followed during both the seasons of spring and autumn for cocoon crops in the selected districts.

IV. Plan of the Study

Chapter I outlines the objectives and methodology of the study. Chapter II discusses the various stages of cocoon production and describes the general characteristics of sericulturists. Chapter III attempts to estimate the average area under mulberry, production of cocoons, productivity of land, labour and capital and income and employment. It also discusses the marketing mechanism of cocoon production and the share of gains accruing to different agents of production. Chapter IV describes nature

of participation of the members of family especially women engaged in sericulture. It also discusses the perception of Women and their role in sericulture activity. Finally, Chapter V summerises the general findings of the study and suggest certain specific policy measures to promote the sericulture activity and improve the economic conditions of those engaged in it in Dehradun and Saharanpur districts of U.P. and Solan in Himachal Pradesh.

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CHAPTER - II

GENERAL CHARACTERISTICS

This chapter discusses some general characteristics of sericulture in the districts of Dehradun, and Saharanpur of Uttar Pradesh and Solan in state of Himachal Pradesh. This is considered important because the production process is quite complex in sericulture which involves number of stages and characteristics tend to help in a great deal in understanding the sericulture activity. We may now first discuss the production process.

I. Production Process

Sericulture activity has various stages starting from hatching of silkworms to the production of 'pupa', that is the formation of silk cocoon. The rearing of cocoon is carried out at different stages. It is carried out in ordinary trays, made of bamboo or a wooden called 'thathes'. The rearing stand requires cleaning carefully. The room or place where the rearing stand is kept needs good ventilation and must be free from dust. In case of mud floor, cow or

buffallow dung is used for cleaning. In case of cemented or stone floor, normally water but sometime diluted formalin solution is applied for cleaning. Generally the head of the household takes the decision about the source from where silkworm eggs are to be procured. In selected districts, silkworm eggs are procured from government organisations, i.e., different Technical Service Centres, under which a particular village household is located. Procurement of silkworm eggs from individual farmers is, however, insignificant. The acquisition of superior quality of silkworm eggs containing good amount of yolk material is a difficult task, which requires special skills and expertise. After the eggs are procured, they are preserved carefully. Sheets of paper are spread out in rearing trays and covered with paraffin paper or ordinary newspaper. Sometimes, pieces of cloths or grasses with a small hole are also used to preserve the eggs properly. So as to obtain uniform hatching of eggs, the eggs are placed in a card board box and wrapped up in a black piece of paper or black sheet of paper. Cloth pieces and grasses are also applied some times by some farmers for hatching of the eggs as it requires skill and carefulness. It is generally performed by the experienced male members of the household assisted normally by the staff members of the nearby Technical Service Centre.

At the initial stage, on the expected date of hatching, women go to the field to pluck the mulberry leaves. Women instructed by the staff members of the TSC or the skilled

person, pluck a particular quality of leaves which are required for feeding to the worms. Generally, at the initial stage, succulent and dark green colour of mulberry leaves are required for feeding the worms. Mulberry leaves are normally plucked twice on a day i.e., before 9 A.M. and after 1 P.M. After plucking the leaves, these are chopped into smaller pieces and are used to feed the young silkworms. When women are not available, men go to the field and pluck the mulberry leaves. The mulberry leaves are minutely chopped and thereafter spread over on the rearing trays. The worm starts eating the leaves. As the worm start growing, cutting of mulberry leaves and feeding the worms tend to increase simultaneously. Apart from the above, the rearing trays are cleaned once in a day or two. Windows are open for 15 hours for lighting. Rooms are warmed between 72 to 80 degree F., and wetted between 60 to 90 degree F. When the room is very warm, clothes mixed with water are kept on the gate and wetted muds are kept beneath the rearing trays. Dry and eaten leaves and worms excreta are taken out and waste is used for compost or given for feeding to the household cattles. These are less skilled activities.

Spacing of worms in the trays also needs care and attention. When worms begin to grow, the space becomes scarce, which leads to undernourishment and lower growth of silk worms. It requires additional space in the trays. Therefore, if worms are overcrowded in spots on rearing trays, they are removed and redistributed uniformly. Worms

are rearranged in such a manner that they have equal access to the green mulberry leaves. Normally, one ounce of silk worms require 6 to 10 tray in the third stage, 36 to 50 trays in the fourth stage and 80 to 100 trays in the fifth stage for appropriate development.

Further, one ounce of silkworms generally consume 75 kg. of mulberry leaves in the third stage, 300 kg. of leaves in the fourth and 725 kg. of leaves in the fifth stage. In all, one ounce of worms consumes 1100 kg. of leaves. One mulberry tree between 5 to 15 years of age provides 10kg of leaves. Thus one ounce of worms require 100 mulberry trees, which tend to produce 50 kg of cocoons. The various stages of cocoon production are described here below :

1. Cleaning the rearing houses before the silkworms are kept.
2. Getting the trays ready for further extension of bed.
These two are preparatory work.
3. Feeding the worms after 3rd stage (first stage in natural works (Titli), while second stage consists of egg producing (Titli) and the third stage is newly born eggs not capable of eating the leaves). Feeding is done 4-5 times a day starting generally from 3 AM in the morning and is continued till 12 mid night. However, the recommended practice is from 6 AM to 9 PM, i.e., 4-5 times only.

4. Changing the bed in each of the trays. There will be 55-60 trays by the time they reach the 5th stage. After fifth stage feeding of mulberry leaves is discontinued.
5. Placing of worms in the mountages. This is the last stage of rearing.
6. Harvesting the cocoons.
7. Cleaning the cocoons.
8. Marketing of cocoons. When crop of rearing is over. The work houses are cleared and trays are smeared for next rearing.

The entire process starting from the first stage to the sixth stage (complete cocoon) takes 17-18 days. In selected districts, normally four crops of sericulture are carried out. These are spring I and II and Autumn I and II crops, which are also called as early spring and late spring and early autumn and late autumn. Spring crop starts in April and ends in May, while autumn starts in October and ends in November month of the year.

II. Structure of Sericulturists

We may now discuss the various structural characteristics of sericulturists. At the out set, it may be

added that sericulture is not a full time activity. It only provides part time jobs to the members of the households, who after completing their work from agriculture are engaged in sericulture. Thus, unused time is utilised in sericulture activity and in return, income is generated. For the sake of analytical convenience, we attempt herebelow to examine the various characteristics of sericulturists across different land holding classes, such as, < 1 acre, 1 to < 2 acres, 2 to < 4 acres and > 4 acres.

II.I. Households, Average Household and Mulberry Acreage by Operational Land Holding Size Classes

Table II.1 describes the number of households by land size classes, operational holdings and land used for mulberry cultivation. It is found that in Dehradun, the largest number of households i.e., 23 households (or 35.14 per cent) belong to less than 2 acre of operational land holding class. Next 21 households come to less than 1 acre of operational land holding class (or 32.81 percent). Under the operational land holding class of 2 to less than 4 acre, 16 households (or 25 percent) are found existing. In all, 64 households are found in Dehradun district.

As far as the operational holding per household is concerned, it is 19.25 acres in the last category followed by 2.63 acres in the third category and 1.34 in the second

Table II.1: Estimated Total Number of Households, Average Per Household Holdings and Average Area Under Mulberry Cultivation Under Operational Land Holding Classes : Dehradun

Operational land holding class (Acre)	Household (No)	Operational holding (Acre)	Mulberry acreage (Acre)
< 1	21	0.43	0.25
1 - <2	23	1.34	0.20
2 - <4	16	2.63	0.21
> 4	4	19.25	0.19
All	64	2.49	0.22

Source : Based on primary data.

category of operational land holding class. In the first category, the average operational holding comes to 0.43 acre, on an average. The average operational holding for all classes comes to 2.49 acres. The area under mulberry comes to 0.25 acre in the first, 0.20 second, 0.21 third and 0.19 acre in the last category of operational landholding class. The mulberry acreage comes to 0.22 acres on an average for all categories. It appears that mulberry cultivation activity does not depend on the size of operational land holding. As the operational land holding increases the mulberry acreage declines. For instance, under the first category, the area under mulberry was found to be 58.14

percent of operational land holding. The corresponding ratio since then had kept on declining which was 13.98 per cent in second, 7.98 in third and 0.99 acre in the fourth category. The percentage of mulberry acreage as a percent of operational land holding comes to 8.83. This tends to suggest that the mulberry area under cultivation, is not the function of size of land holding and that other socio-economic factors are more significant for mulberry cultivation.

In case of Saharanpur district, the analysis of our primary data indicates that the sericulturist households are more in number in large size of land holdings as against their number in small land size. We got information about only 5 households owning land size of less than one acre as against 33 sericulturists owning land size of more than 4 acres. Such a situation, that the number of sericulturists with large size of holdings are more gets further reflected from the average operational land holdings and average mulberry acreage under different land size-groups. Here, again we observe higher average size of operational holdings and average mulberry acreage of households with larger land size. Hence, we may say that the sericulture activity has been adopted more by the farmers with large size of land holdings as compared with farmers owning the marginal and small holdings. The table II.2 clearly reveals the observed facts.

Table II.2 : Estimated Total Number of Households, Average Per Household Operational Land Holding and Average Area under Mulberry Cultivation Across the Land Size Classes : Saharanpur

Operational land holding class (Acre)	Household (No.)	Operational land holding (Acre)	Mulberry acreage (Acre)
< 1	5	0.73	0.45
1 - <2	10	1.20	0.26
2 - <4	15	2.71	0.53
>4	33	8.79	0.82
All	63	5.50	0.63

Source : Based on Primary data.

In case of Solan district, we, by and large, found a similar situation as in the case of Dehradun district in the state of Uttar Pradesh. For instance, when we move from first operational land holding class to second, the number of households declined from 23 to 19, but operational holding increased from 0.31 acres to 1.10 acres. However, when we move from IInd land holding strata to third, number of households increased from 19 to 22, but operational land holding increased from 1.10 acres to 2.23 acres. A reverse trend followed when we moved from operational land holding size of third to fourth, which confirmed a decrease in the number of households from 22 to 16, but an increase in

operational holding from 2.23 acres to 7.90 acres. On an average, operational holding comes to 2.40 acres per households. However, area under mulberry did not show a consistent relationship with operational land holding. Whereas operational land holding increased across the households and operational holding classes, the mulberry acreage fluctuated; it was 0.28 acre in the first, 0.26 acre in the second, 0.24 acre in the third and 0.21 acre in the fourth category of operational land holding classes. The average mulberry acreage comes to 0.24 acre per household for Solan district as a whole.

Table II.3 : Estimated Total Number of Households, Per Household of Occupation Land Holding and Average Area Under Mulberry Cultivation Across the Operational Land Holding Classes: Solan

Operational land holding Class (Acre)	Household (No.)	Operational land holding (Acre)	Mulberry acreage (Acre)
< 1	23	0.31	0.28
1 - <2	19	1.10	0.26
2 - <4	22	2.23	0.24
>4	16	7.90	0.21
All	80	2.40	0.24

Source : Based on Primary data

Based on the general observations, it appears that mulberry acreage is related inversely with the operational land holding in the case of Solan district. May be that sericulture activity has been more profitable for the small and marginal farmers than the larger ones, who can maximise their earnings through various commercial crops.

II.II Sericulturists by Type of Rearing-room and Type of Use of Rearing Room

We may now discuss sericulturist households by the types of rearing room facility across the operational land holding classes. This is recorded in table II.4 for Dehradun. It may be seen that in the first category (i.e. under operational landholding class of less than 1 acre), a largest number of sericulturists (20) has the rearing room facility away from the dwelling unit. The second comes the number of sericulturist having rearing rooms adjacent to their dwelling units. However, sericulturists with rearing rooms as technically specified have been found to be non-existent. A much similar situation has also been found in the case of the second category of operational land holding class as 20 sericulturists have rearing rooms away from dwelling units and 2 have rearing rooms adjacent to dwelling units. However, household as technically specified was found to be only 1. Under the third category of operational

holding class, 8 sericulturists have rearing room away from the dwelling unit and equal numbers have rearing room adjacent to dwelling units. Under the final category of operational holding class, there are only 4 sericulturists having rearing room facility away from the dwelling unit. However, sericulturists with rearing room adjacent to dwelling unit and technically specified are found to be non-existent. Also, 21 households under the first category, 23 under the second category, 16 under the third and 4 under the fourth category of land holding classes used rearing rooms for other than rearing purposes (Table II.4).

The types of rearing rooms used by our sample households of different land size groups in Saharanpur district have been given in table II.5. It is evident that only 43 per cent of the sample household numbering only 27 use technically specified rearing rooms in the district. Nearly the same number of households have rearing rooms away from their dwelling units. 8 households were reported to have rearing rooms adjacent to their dwelling units. If we examine the type of rearing rooms used by the sericulturists of different land size groups, it is found that technically specified rearing rooms are being used more by the households with large size of holdings. The households whose rearing rooms are away from their dwelling units are also found to be more

Table II.4 : Sericulturists by Type of Rearing Rooms and by Type of Use of Rearing Room Across Land Holding classes : Dehradun

(No. of Households)					
Particulars	Operational land holding Class				
	< 1 acre	1 to < 2 acres	2 to < 4 acres	> 4 acres	All
<u>A Household by Type of Rearing Room</u>					
1. As technically specified	-	1	-	-	1
2. Adjacent to dwelling unit	1	2	8	-	11
3. Room away from dwelling unit	20	20	8	4	52
All	21	23	16	4	64
<u>B. Households Using Rearing Room</u>					
1. Exclusively for rearing	21	23	16	4	64
2. Rearingroom for purposes	-	-	-	-	-
All	21	23	16	4	64

Source : Based on primary data.

Table II.5 : Sericulturists by Type of Rearing Rooms and by Type of Use of Rearing Room Across Land Holding Classes : Saharanpur

(No. of Households)

Particulars	Operational land holding class				All
	< 1 acre	1 to <2 acres	2 to <4 acres	> 4 acres	
A. <u>Household by Type of Rearing room</u>					
1. As technically specified	1	1	3	22	27
2. Adjacent to dwelling unit	1	4	3	--	8
3. Room away from dwelling unit	3	5	9	11	28
All	5	10	15	33	63
B. <u>Household using Rearing Room</u>					
1. Exclusively for rearing	2	5	10	20	37
2. Rearing room for other purchase	3	5	5	13	26
All	5	10	15	33	63

Source : Based on primary data.

in number for large size of landholding as against those with smaller size of land. The practise of using rearing rooms exclusively for the rearing purpose has also been found to be more by the large land owing households in Saharanpur.

In Solan district, it was found that under the first land holding size, there were 23 households, of which 18 had rearing rooms adjacent to dwelling units, 3 households had rooms as technically specified, while 32 households had rearing rooms away from the dwelling. Under the second category of operational land holding size, out of 19 households, 16 had rearing rooms adjacent to their dwelling unit, 2 households away from the dwelling unit, while only 1 household had the room in accordance to the technical specifications. Similarly, under the third category of land holding class, out of 22, 17 households had rearing rooms adjacent to dwelling unit, 3 in accordance to technical specifications and 2 households away from the dwelling unit. Under the fourth category of land holding class, out of 16, 10 households had rearing rooms adjacent to dwelling unit, 4 in accordance to technical specifications and 2 had away from the dwelling. Of the total of 80 households, 61 households had rearing rooms adjacent to dwelling units, 11 in accordance with technical specifications, while 8 households had rearing rooms away from the dwelling units (Table II.6).

Table II.6 : Sericulturists by Type of Rearing Rooms and by Type of Use of Rearing Room Across Land Holding Classes : Solan

(No. of Household)

Particulars	Operational Land Holding Classes				All
	< 1 acres	1 to <2 acres	2 to <4 acres	> 4 acres	
<u>A. Household by Type of Rearing Room</u>					
1. As technically specified	3	1	3	4	11
2. Adjacent to dwelling unit	18	16	17	10	61
3. Room away from dwelling unit	2	2	2	2	8
All	23	19	22	16	80
<u>B. Household Using Rearing Room</u>					
1. Exclusively for rearing	8	7	8	6	29
2. Rearing room for other purposes	15	12	14	10	51
All	23	19	22	16	80

Sources : Based on Primary data.

This tends to suggest that a majority of households had rearing rooms adjacent to their dwelling units (77 per cent), followed by technically specified rooms (14 per cent) and rooms away from the dwelling units (10 per cent). With regard to the nature of rearing rooms, it was found that of the 23 households under the first category of land holding class, 15 households used rearing rooms for other than rearing purposes, while, 8 used them for rearing exclusively. Under the second, third and fourth categories of land holding classes, a similar picture has also emerged. It would thus imply that a majority of households (64 per cent) used rearing rooms for other than rearing purposes, while rest (36 per cent) used rearing rooms exclusively for rearing (Table II.6).

II.III Availability of Trays By Sericulturists

Tray is an essential need for operation of Sericulture activity, where silkworms are kept and spread out. Inadequacy of trays generally affects the production of cocoons. Table II.7 classifies the availability of trays by land holding sizes in Dehradun.

In Dehradun, under the first category of operational land holding class, average number of trays per household comes to 44; 52 under the second, 44 under the third and 60 under the fourth category of operational land holding class. The average number of trays was worked out to be 50 per

Table II.7 : Average Number of Tray Owned by Per Household, Average Price Per Tray and Percentage of Households Requiring More Trays and Methods of Acquisition for Each Operational Land Holding Classes: Dehradun

Operational land-holding Classes (Acre)	Average trays per Household (No.)	Price Per tray (Rs.)	Methods of Acquisition (Per cent)				Total
			Percentage of house-holds wanting more trays	On rent	On exchange	Buy	
< 1	44	38	15	67	33	--	100.00
1 < 2	52	34	9	--	50	50	100.00
2 < 4	44	32	13	--	--	100.00	100.00
> 4	60	30	100	--	--	100.00	100.00
All	50	34	18	19	19	62	100.00

Source : Based on primary data.

household. Average price, per tray varies across the size of operational land holdings being Rs.38 for the first, Rs.34 for the second, Rs.32 for the third and Rs.30 for the fourth category of operational land holding classes. The average price has been worked out at Rs.34 per tray.

We further enquired about the future requirement of trays by households across the land holding classes. Under the first category of land holding class, 15 per cent of

households of this category expressed desired to acquire trays, of which 67 per cent wanted on rent, while 33 per cent on exchange basis. Under the second land holding class, 9 per cent of household of this category households wanted to have trays, of which 50 per cent on exchange and an equal percentage on purchase basis. Under the third category of land holding class, 13 per cent of households expressed desire to acquire trays merely on purchase basis alone. Under the fourth category of land holding class, 100 per cent of households of this group wanted to acquire trays on purchase basis alone. Of the total households, 18 per cent of households expressed desire to obtain trays for future requirement, of which 19 per cent on rent, same on exchange and 69 per cent on purchase basis. From the above discussion, it appears that households belonging to lower land holding classes purchase trays at higher price than to those belonging to higher land holding classes (Table II.7).

The average number of trays per household used by the sericulturist households in Saharanpur district are found to be 28 at the aggregate sample level. The average price per tray comes to Rs.29. The 46 per cent of the total households wanted to obtain more trays, out of which, 96 per cent desired to buy these trays. Only 4 per cent of those requiring more trays wanted them on rent. Table II.8 shows the average trays per household, price per tray, percentage of sericulturists wanting to obtain more trays and how they are willing to get the trays.

Tabl II.8 : Average Number of Trays Owned by Per Household, Average Price Per Tray, Percentage of Households Requiring More Trays and Methods of Acquisition for each Operational Land Holding Classes : Saharanpur

Operational land holding classes (Acre)	Average trays per household (No.)	Price per tray (Rs.)	Percentage of households wanting more trays	Methods of acquisition (Per cent)				
				On rent	On exchange	Buy	No response	Total
< 1	26	28	20	-	-	100	-	100
1 - < 2	26	28	20	50	-	50	-	100
2 - < 4	30	31	14	-	-	100	-	100
> 4	31	31	73	-	-	100	-	100
All	28	29	46	4	-	96	-	100

Source : Based on Primary data.

As far as the trend across different farm-size groups is concerned, the large size land owning sericulturist household possesses more trays as compared to the small land holders. The price per tray indicates very marginal difference across different farm size-groups. Most of the sericulturist households with small land size are not evidently eager to obtain more trays except in land category of 4 acres and above where 73 per cent of the total sericulturists of this

group are eager to obtain more trays. Mostly those who are interested to get more trays, are also interested to buy the trays.

The average number of trays and its future requirements have been described in table II.9 for the Solan district of Himachal Pradesh. Under the first category of land holding size, the average trays were worked out to 14 per household, 17 for the second, 21 for the third and 25 for the fourth land holding classes. The average number of trays is found to be 22 per household in Solan district. The price per tray is found to be Rs.29 for the first category, Rs.30 for the second, Rs.31 for the third and Rs.30 for the fourth category of land holding class. The average price works out at Rs.30 per tray in the district.

With regard to additional requirement of trays, of the first category households, 13 per cent wanted additional trays, of which 33 per cent wanted on rent, while 67 per cent desired to buy the trays. Of the second category households, 11 per cent wanted to acquire additional trays, of which all of them desired to purchase the trays. Similar was also the case with respect of households falling under the third category of land holding class. Under the fourth category of land holding class, 82 per cent of households wanted to procure additional trays, of which 40 per cent expressed desire on rent and rest (60 per cent) wanted to purchase the trays from the market. In Solan district, 27 per cent of households expressed desire to procure additional trays, of

which 66 per cent wanted to buy the trays from the market, while 34 per cent on rental basis. This implies that trays per household and its additional requirement have kept on rising with the rise in land holding size of households (Table II.9).

Table II.9 : Average Number of Trays Owned by Per Household, Average Price Per Tray; Percentage of Households Requiring More Trays and Methods of Acquisition for Each Operational Land Holding Classes: Solan

Operational land holding Class (Acre)	Average Trays per household (No.)	Price per tray (Rs.)	Percentage of households wanting more trays	Methods of Acquisition (Per cent)				
				On rent	On exchange	Buy	No response	Total
< 1	14	29	13	33	-	67	-	100
1 - < 2	17	30	11	-	-	100	-	100
2 - < 4	21	31	14	-	-	100	-	100
> 4	25	30	82	40	-	60	-	100
All	22	30	27	34	-	66	-	100

Source : Based on primary data.

II.IV Availability of Stands by Sericulturists

We may now discuss the availability of stand and its price according to operational land holding classes. This is recorded in Table II.10. We find that in Dehradun, stand per household comes to one, while price per stand is worked out at Rs.78.25, on an average. Price per stand, however, varies across the operational land holding classes of households. Generally, households with large land holding classes have paid high price than those with small and marginal land holding classes (Table II.10).

Table II.10 : Average Number of Stands Owned by Per Household and Average Price Per Stand for Each Operational Land Holding Classes : Dehradun

Operational land holding class (Acre)	Stand per household (No.)	Price per stand (Rs.)
< 1	1	63
1 - < 2	1	66
2 - < 4	1	75
> 4	1	109
Average	1	78.25

Source : Based on Primary data.

The average number of stands owned per household and the average price of the stand per household in case of our sample sericulturists of Saharanpur have been shown in the table II.11. It is evident from this table that on an average 2 stands are owned by per household. The price per stand comes to Rs.89. We do not get substantial variation across different farm-size groups in terms of stand per household and price per household except in case of land class of 4 acres and above. The households possess on an average one stand and pay a lower average price per stand (Rs.65 as against the average price per stand of Rs.89).

Table II.11 : Average Number of Stands Owned by per Household and Average Price Per Stand for Each Operational Landholding Class : Saharanpur

Operational land holding class (Acre)	Stand Per household (No.)	Price Per Stand (Rs.)
< 1	2	85
1 - < 2	2	91
2 - < 4	2	96
4 >	1	65
Average	2	89

Source : Based on Primary data.

In Solan district the number of stands per household comes to one for each class of operational land holding. There are, however, variations in the price per stand; it is Rs.68 per stand for the first category of land holding class; Rs.70 for the second; Rs.72 for the third and Rs.78 for the fourth category of land holding class. In Solan, the price worked out to be Rs.72 per stand (Table II.12). Thus, there appears to be a positive relationship between the land size based households and the price per stand in Solan district.

Table II.12 : Average Number of Stand Owned by per Household and Average Price Per Stand for Each Operational Landholding Class : Solan

Operational land holding class (Acre)	Stand Per household (No.)	Price Per stand (Rs.)
< 1	1	68
1 - < 2	1	70
2 - < 4	1	72
4 >	1	78
Average	1	72

Source : Based on Primary data

II.V Availability of Mountage By Sericulturists

The average mountage owned per household and average price per mountage have been shown in table II.13 for Dehradun Sericulturists. On an average, the sericulturist has one mountage on the price of Rs.13. No variation is evident in terms of average number of mountage per household across different farm size groups.

Table II.13 : Average Mountage Owned by Per Household And Average Price of Mountage According to Operational Land Holding Classes : Dehradun

Operational land holding class (Acre)	Mountage per house- hold (No.)	Price per mountage (Rs.)
< 1	1	13
1 - < 2	1	13
2 - < 4	1	13
> 4	1	13
Average	1	13

Source : Based on Primary Survey

In Saharanpur, moutage per household comes to one on the price of Rs.14. However, there is negligible price difference in respect of price per moutage among different farm-size groups (Table II.14). It has been observed during

Table II.14 : Average Moutage Owned by Per Household and Average Price of Moutage According to Operational Land Holding Classes : Saharanpur

Operational land holding class (Acre)	Moutage Per household (No.)	Price Per moutage (Rs.)
< 1	1	14
1 - < 2	1	13
2 - < 4	1	13
4 >	1	15
Average	1	14

Source : Based on Primary data.

field visits that mostly twigs are being used in place of prescribed moutages. As a result, we are finding very low average number of moutages per household in Dehradun and Saharanpur.

We may now discuss the moutage owned per household and the average price of moutage in Solan district of Himachal Pradesh. This is described in table II.15. It is found that

Table II.15 : Average Mountage owned by Per Household and Average Price Of Mountage According to Operational Land Holding Classes : Solan

Operational land holding class (Acre)	Mountage per household (No.)	Price Per Mountage (Rs.)
< 1	1	11
1 - < 2	1	12
2 - < 4	1	11
4 >	1	13
Average	1	12

Source : Based on Primary data.

there is only one mountage per household across the different land holding classes. There are, however, variations in average price of mountage, which is Rs.11 for the households under the first, Rs.12 for under second, Rs.11 for under third and Rs.13 for the households under the fourth category of land holding classes. In the district as a whole, the number of mountages works out to be only one and its average price is Rs.12. It may, however, be mentioned that the use of mountage is quite meagre in Solan, as twigs are commonly used in its place. Thus, both mountages and twigs are used. Most of households prefer to use twigs in the place of mountage to economise the cost of cocoon production.

III. Credit Requirement

Availability of finance is equally important for cocoon production. Table II.16 describes the households by sources of finance in Dehradun across the different operational land holding classes. Under the first category, out of 21 households, 9 households took loans, while rest (12) relied on their own sources. This finding is seen unaltered for the households under the remaining categories of land holding sizes as well. For instance, out of 23 households, 10 have taken loan under the second land size group; Out of 16, 6 under the third; out of 4, none under the fourth category of land holding class. In all, about 61 per cent of households relied on their own sources of finance, while rest (39 per cent) on external sources of finance. Also, those households who relied on external sources of finance took loan mainly on the basis of credit purchase (25.02 per cent) followed by banks (9.38 per cent). Friends and relatives as lenders appeared least significant (4.70 per cent) in Dehradun district.

The pattern of households depending on sources of financing for the Silk Worm rearing shows that roughly 81 per cent of the total sample households have relied on their own financial resources. Only 2 per cent obtained loan from the bank and remaining 17 per cent on credit purchase. As is

Table II.16 : Dependence of Households on Sources of Finance for Silk Worm Farming According to Each Operational Land Holding Classes : Dehradun

Operational land holding class (Acre)	Self	Bank	Co-ope- ratives	Credit Purcha- se	Co- coon tra- ders	Money len- ders	Frien- ds/re- latives	Total
	(57.15)	(19.05)		(23.80)				(100.00)
1 - < 2	13 (56.53)	-	-	9 (39.13)	-	-	1 (4.34)	23 (100.00)
2 - < 4	10 (62.50)	2 (12.50)		2 (12.50)	-	-	2 (12.50)	16 (100.00)
4>	4 (100.00)	-	-	-	-	-	-	4 (100.00)
All	39 (60.90)	6 (9.38)	-	16 (25.02)	-	-	3 (4.70)	64 (100.00)

Note : Figures in brackets denote per cent to total households.

Source: Based on Primary data.

evident from the Table II.17 that financing of the Silk Worm rearing by own sources is being done by lesser number of households with small land holdings as compared with the large land owning sericulturists who mostly manage from their own sources (Table II.17).

Table II.17 : Dependence of Households on Sources of Finance for Silk Worm Farming According to Each Operational Land Holding Classes : Saharanpur

Operational land Holding class (Acre)	Self	Bank	Co-op erati- ve	Credit Purch- ase	Cocoon traders	Money len- ders	Friends/ relativ- es	Total
< 1	3 (60.00)	-	-	2 (40.00)	-	-	-	5 (100.00)
1 - < 2	6 (60.00)	1 (10.00)	-	3 (30.00)	-	-	-	10 (100.00)
2 - < 4	12 (80.00)	-	-	3 (20.00)	-	-	-	15 (100.00)
4>	30 (90.91)	-	-	3 (9.09)	-	-	-	33 (100.00)
All	51 (80.91)	1 (1.59)	-	11 (17.45)	-	-	-	63 (100.00)

Note : Figures under brackets denote percent to total households.

Source : Based on Primary data.

The financial requirement in Solan followed the pattern of Dehradun and Saharanpur districts. A majority of households have relied on their own sources of finance. This is, however, found variable for households falling under different operational land holding sizes and aggregate households as well. However, those households who relied on external sources of finance obtained loan on credit purchase basis. Such households are 18.75 per cent. Commercial and non-commercial banks and friends and relatives appeared as of equal significance, which provided loan to 3.75 per cent households in equal proportion (Table II.18).

Table II.18 : Dependence of Households on Sources of Finance for Silk Worm Farming According to Each Operational Land Holding Classes : Solan

Operational land holding classes (Acre)	Self	Bank	Co-op erati- ve	Credit Purch- ase	Cocoon traders	Money len- ders	Friends/ relativ- es	Total
< 1	20 (86.96)	-	-	3 (13.04)	-	-	-	23 (100.00)
1 - < 2	12 (63.16)	2 (10.53)	-	3 (15.79)	-	-	2 (10.52)	19 (100.00)
2 - < 4	15 (68.19)	1 (4.55)	-	5 (22.71)	-	-	1 (4.55)	22 (100.00)
4 >	12 (75.00)	-	-	4 (25.00)	-	-	-	16 (100.00)
Total	59 (73.75)	3 (3.75)	-	15 (18.75)	-	-	3 (3.75)	80 (100.00)

Note : Figures under brackets show per cent to total households.

Source : Based on Primary data.

IV. Awareness of Bank Loan Facility

We may now enquire about the awareness of loan facility available in different banks. Table II.19 provides the information on households aware of bank loan facility across the different land holding classes for Dehradun. We find

Table II.19 : Awareness of the Households About Bank Loan Facility: Dehradun

Operational landholding Class (Acre)	Households aware of the bank loan facility (Nos.)
< 1	15 (71.43)
1 - < 2	18 (78.26)
2 - < 4	10 (62.50)
4 >	2 (50.00)
All	45 (70.32)

N.B. : Figures in brackets indicates percentage to total household in different land size classes.

Source: Based on primary data.

that 15 households (or 71.43 per cent) under the first; 18 (or 78.26 per cent) under the second; 10 (or 62.50 per cent) under the third; and 2 households or (50 per cent) under the fourth category of land holding classes are aware of the loan facility available from different banks. It is interesting to observe that households under the second group of land holding class are more aware about the bank loan facility than the rest, who, however, have not taken loan. This is because they have generally relied on their own source of finance. Households under first and fourth categories, have significantly relied on their own financial resources and marginally on banks to meet their financial requirement. In all, over 70 per cent of households are aware of the loan facility available in different banks.

As far as the awareness of bank loan facility among the sericulturists of Saharanpur district is concerned, over 73 of the sample households are aware about the availability of bank loan facility. The level of awareness, no doubt, appears to be high among the large size land holders but a sizeable proportion of small sericulturists are also aware of the availability of bank loan facility. Table II.20 shows the number of households who are aware of the availability of bank loan facility.

Table II.20 : Awareness of the Households About Bank Loan Facility : Saharanpur

Operation landholding classes (Acre)	Households aware of the bank loan facility (No.)
< 1	3 (60.00)
1 - < 2	4 (40.00)
2 - < 4	10 (66.67)
4 >	29 (87.88)
All	46 (73.02)

N.B. : Figures in brackets indicates percentage to total households in different land size classes.

Source: Based on Primary data.

In Solan, a similar pattern of loan facility is seen to have emerged as in cases of Dehradun and Saharanpur. Table II.2 portrays the awareness of loan facility by households across the different land holding classes. We find that 9 households (or 39.13 per cent) under the first; 10 (or 52.64 per cent) under the second; 13 or (59.09 per cent) under the third; and 8 households (or 50 per cent) under the fourth category of land holding class are aware of loan available in different banks. In the district as a whole, 40 households (or 63.50 per cent) are found to be aware of the loan facility. It is interesting that despite the awareness of

loan facility, a majority of households do not exploit this opportunity and they rely on their own sources of finance followed by credit purchase and on friends and relations.

This tends to suggest that in Dehradun, Saharanpur and Solan districts, a majority of households are aware of loan facility available in different banks, but they have not exploited the opportunity as most of them have relied on their own and other channels of finance. May be that procedures for obtaining loans are too complex and cumbersome to make the bank loan easily available to sericulturist households.

Table II.21 : Awareness of the Households About Bank Loan Facility : Solan

Operational landholding Class (Acre)	Households aware of the loan facility (Nos.)
< 1	9 (39.13)
1 - < 2	10 (52.64)
2 - < 4	13 (59.09)
4 >	8 (50.00)
All	40 (63.50)

N.B. : Figures in brackets indicate to total households in different land size classes.

Source : Based on Primary data.

V. Concluding Observations

Present chapter examines the production process and structural characteristics of sericulturists in Dehradun, Saharanpur districts of U.P. and Solan in Himachal Pradesh. It has been examined across the operational land holding classes i.e., < 1 acre, 1 to < 2 acres, 2 to < 4 acres and > 4 acres. It is generally found that mulberry acreage declines with the increase in size of land holdings. It has also been discovered that in Dehradun and Saharanpur, a majority sericulturist households has rearing rooms away from their dwelling units and that rearing rooms are used exclusively for rearing purposes. In Solan, a majority of households has rearing room adjacent to dwelling unit, which are used for other purposes also. Rearing trays are found to be sufficient for production of cocoons and those households desirous of additional trays, want to have these either or rent or wish to purchase from the market.

Similarly, stands available in the sericulture unit are found to be sufficient. The price of stand increases with the increase in operational land holding classes. There appears to be one mountage per household. It has been reported that tree twigs are also used interchangeably for mountages side by side. Generally, most of the sericulturists are dependent on their own resources. Those who depend on

external sources have generally relied on banks and relatives and friends. The infrastructure and other facilities discussed so far tend to determine the level of production, productivity and thereby the marketability of the cocoons, which calls for the empirical examination on these aspects in selected districts. These aspects have empirically been examined in the forthcoming chapter III.

CHAPTER III

PRODUCTIVITY, INCOME AND EMPLOYMENT GENERATION AND MARKETING MECHANISMS

I. Introduction

The sericulture is generally described as 'non-form' 'household husbandry' activity. It is spread over in various sericulturally developed traditional states and has gradually been receiving importance in non-traditional sericulture growing states as well. This is because sericulture has now been recognised as more productive employment generating than those of other activities undertaken in the villages at the household level. However, nature and magnitude of employment generation differs across different states on account of inbuilt structural characteristics and historical, socio-economic factors. Present chapter in the light of above seeks to examine: (1) productivity differentials, (2) appropriation of surplus among the production agents, (3) marketing mechanisms and (4) responses articulated by non-sericulturists in Dehradun and Saharanpur districts of Uttar Pradesh and Solan in Himachal Pradesh.

II. Productivity Differentials

Word "productivity" was first coined in 1776 and there after it had been defined differently by various economists in different ways.¹ It is considered as a universal and simple concept. It connotes the functional relationship between output and input to achieve "set of results", "highest level of performance", "organisational objectives", "total tangible output" and "all measurable output".² As of today, productivity reflects the efficiency of work process, which ultimately leads to the optimal utilisation of resources. Thus, the concept of productivity is multi-dimensional, which not only indicates the efficiency of input to produce output but also includes the satisfaction of consumers. Such an integrated approach implies the "comprehensive holistic phenomena encompassing all elements required to improve products/output (satisfaction of customers) and inputs, optimisation of resources and inputs.....Productivity in its holistic meaning has developed "pull" approaches so that every thing done in the organisation is linked to and pulled by customer needs rather than pushed by the management".³

Major components of productivity are labour productivity, capital productivity, input productivity and overall total productivity. Labour productivity is defined as the ratio between the output and the labour input required

to produce a given level of output. Capital productivity implies the ratio between the output and capital input. It refers to quality and quantity of building, plant, equipment and technology and resources devoted to research and development.⁴ Similarly, input productivity is defined as ratio between output and the input. It, thus, denotes the quality of input, which is ultimately transformed into final output.⁵ Finally, 'total productivity is the optimal achievement of economic and social benefits through the appropriate use of labour, capital and other resources to provide quality goods and services.⁶ In the present exercise, a comprehensive holistic approach of productivity has been followed, under which efficiency of inputs and other resources is linked with the optimum satisfaction consumers.

Unfortunately, data base required for assessing productivity has been considered to be inadequate in case of Dehradun district. It is, therefore, essential to estimate the relevant data required for productivity estimation. Thus, methodology suggested by ISI, Calcutta, has been applied for this purpose, which is described as hereunder:

$$\frac{\sum X}{n} = \frac{\sum_{j=1}^{n_j} \frac{\sum_{k=1}^n \frac{\sum_{j=1}^{n_k} \frac{\sum_{j=1}^{n_{js}} X_{isjk}}{n_{nk} P_k P_j n_{js}}}{n}}{n} = \frac{\sum_{j=1}^{n_j} \frac{\sum_{k=1}^n \frac{\sum_{j=1}^{n_k} \frac{\sum_{j=1}^{n_{js}} X_{isjk}}{n_{nk} P_k P_j n_{js}}}{n}}{n}$$

Where,

X_{isjk} = The variable value of X for the i th sample household in the S th stratum in the j th sample village in the k th sample block of Dehradun district.

n_j = Number of stratum in the j th village.

n_{js} = Number of sample household in the S th stratum of the j th sample village.

N_{js} = Total number of household in the S th stratum of the j th sample village.

P_j = Probability of selecting the j th sample village.

n_k = Number of villages selected in the k th sample block.

P_k = Probability of selecting k th block.

n = Number of blocks selected in Dehradun district.

\bar{X} is the estimate of the total of the variable X for Dehradun district as a whole. While tabulating the data in a number of classes, this total has been distributed over the classes depending on the class label attached to each individual household. For a variable X_{isjk} from the i th sample household in the S th stratum of j th sample village in the K th sample block a multiplier is defined as described herebelow:

$$\frac{N_{js}}{n_k P_k P_j n_j}$$

The description of multiplier has already been given earlier. It may be mentioned that while tabulating the variable for a particular household, this has been allotted to a particular cell depending on the classification variables being used. Then the variable value multiplied by the appropriate multiplier has been added to the cell. Similarly, variable from the next household has equally been treated. Finally, when all the households are exhausted, we obtained the estimated total of X for the Dehradun district as a whole. This procedure has been repeated for all the variables to obtain totals of all variables. It may be specifically noted that, while developing an estimate of X , when no value is recorded in the schedule in certain classifications, such X_{isjk} has been assigned to 1 and same process has been followed also for the estimation of other variables at the district level.

It may be mentioned that estimation of variables has only been followed in the case of Dehradun, where sample was the basis of the study. In case of Saharanpur and Solan, estimation is not required as complete enumeration has been done. Based on this methodology, we may now present the baseline data for Dehradun district. For Saharanpur and Solan, the generation of baseline data is based on field based enquiry.

Table III.1 gives information on employment, income, cocoon production and area under mulberry. In Dehradun,

Table III.1 : Various Components in Sericulture Activity in Selected Districts

Districts	Employment (No.)	Income (Rs.) lakhs)	Cocoon pro- duction		Area under mulberry (Acres)
			(Rs. (Kgs.) lakhs)		
Dehradun:					
Actual*	1043	N.A	N.A		235.63
Estimated**	1037	36.30	43133	36.96	140.56
Saharanpur (A)	224	5.71	8677	6.16	39.69
Solan (B)	144	2.88	4132	2.98	19.20

Source : * Annual Progress Report, 1992-93, National Sericulture Project, Ministry of Textiles, Government of India.

** Based on our own estimate

(A) + (B) Based on primary data.

employment according to published source was found to be 1043, while by following the estimation method, it turned out to be 1037. Thus, there was not substantial difference in employment by following either methodology. In Saharanpur, the employment in sericulture was found to be 224, while in Solan 144. Employment figure in sericulture in Dehradun based on published source relates to 1993-94. Thus, marginal difference in employment (6) has incurred due to time lag of one year. As far the income, it is arrived by using value

added approach, which describes income by subtracting total value of costs and other expenses from the gross value of cocoon production. Published source, however, does not provide the relevant information on costs and expenses and, therefore, estimated income derived from estimation procedure has been considered in case of Dehradun. It is found that sericulture has generated the income of Rs.36.30 lakhs in Dehradun, Rs.5.71 lakhs in Saharanpur and Rs.2.88 lakhs in Solan.

For cocoon production, we have once again relied on the estimated figure in case of Dehradun. The cocoon production has been estimated to be 43133 kgs in Dehradun. The corresponding figure comes to 8677 kgs in Saharanpur and 4132 kgs in Solan. In terms of values, it comes to Rs.36.96 lakhs in Dehradun, Rs.6.16 lakhs in Saharanpur and Rs.2.98 lakhs in Solan. As for the area under mulberry, in Dehradun, it is 235.63 acres according to published source, while 140.56 acres according to estimation procedure. Area under mulberry comes to 39.69 acres in Saharanpur and 19.20 acres in Solan. It appears that there is great discrepancy in area under mulberry in case of Dehradun obtained from published source and that from estimation procedure. Such a discrepancy in data needs to be strictly varified, which requires a fresh study at a project level by following the census rather than sample method.

We may now describe the productivity ratios. First, we may discuss in case of Dehradun as productivity in this district is based on the estimated data. This is recorded in table III.2. A close examination of table III.2 indicates that in Dehradun, labour productivity is Rs.3564.26, capital productivity to Rs.2.85, land productivity to Rs.26,295.82 and input productivity to Rs.55.46. Thus, land productivity i.e., cocoon production per acre is found to be highest, while capital productivity the lowest. Productivity ratios for Saharanpur and Solan districts have been recorded in table III.3. Labour productivity comes to Rs.2750.20 in Saharanpur, while Rs.2066.11 in Solan. Capital productivity is Rs.1.07 in Saharanpur and to Rs.0.27 in Solan; land productivity to Rs.15,521.42 in Saharanpur and to Rs.15,495.81 in Solan; and input productivity to Rs.13.74 in Saharanpur and to Rs. 31.25 in Solan.

Table III.4 provides inter districts comparison of productivities. It has been discovered that labour productivity in Dehradun is higher by 1.30 times of Saharanpur and 1.72 times than that of Solan; capital productivity by about 3 times and 11 times; land productivity by about 2 times; and input productivity by 4 times and about 2 times as compared to Saharanpur and Solan respectively. In Saharanpur, all productivity ratios were found to be lower

Table III.2 : Productivity Ratios in Dehradun : 1993-94

Particulars	Productivity (Rs.)
1. Labour productivity O/L	3,564.26
2. Capital productivity O/K	2.85
3. Land productivity O/A	26,295.82
4. Input productivity O/I	55.46

Note : O = Cocoon production in Rs.

L = Persons employed in numbers.

K = Value of fixed capital in Rs.

A = Area under mulberry in acres.

I = Value of inputs in Rs.

Source : Based on primary data.

Table III.3 : Productivity Ratios in Saharanpur and Solan:
1993-94

Districts	Productivity Ratios			
	Labour producti- vity	Capital producti- vity	Land producti- vity	Input producti- vity
	$\frac{O}{L}$	$\frac{O}{K}$	$\frac{O}{A}$	$\frac{O}{I}$
	(Rs)	(Rs)	(Rs)	(Rs)
Saharanpur	2750.20	1.07	15,521.42	13.74
Solan	2066.11	0.27	15,495.81	31.25

Source : Based on primary data.

Table III.4 : Comparison of Productivities Among Selected Districts

Productivity	Dehradun as ratio of:		Saharanpur as ratio of:		Solan as ratio of	
	Saharanpur	Solan	Dehradun	Solan	Dehradun	Saharanpur
Labour productivity	1.30	1.72	0.77	1.33	0.58	0.75
Capital productivity	2.66	10.59	0.39	3.98	0.09	0.25
Land productivity	1.69	1.70	0.59	1.00	0.59	1.00
Input productivity	4.04	1.77	0.25	0.44	0.56	2.28

Source : Based on estimated figure in case of Dehradun and primary survey in Saharanpur and Solan.

than that of Dehradun. However, in Saharanpur labour and capital productivity ratios are found higher, whereas, input productivity lower than that of Solan. Land productivity is found equal both in Saharanpur and Solan. In Solan, input productivity is higher than that of Saharanpur, while land productivity is found same both in Solan and Saharanpur. It is interesting to observe that all productivity ratios in Solan have been found to be lower significantly than that in Dehradun. Also, labour and capital productivity ratios are lower in Solan than that in Saharanpur. Thus, Dehradun emerges as the most productive district as compared to Saharnpur and Solan. In between Saharanpur and Solan, the former had been placed as more productive than the later in terms of labour and capital, whereas later was more productive only in terms of input used in the sericulture activity (Table III.4).

III. Distribution of Surplus

We may now discuss the share of gains among the agents of production. Surplus or value added in the present context has been defined as total cocoon production minus total material cost and expenses. Total material cost in sericulture activity comprises of cost of planting materials, manure, irrigation, pesticide, seeds, mulberry leaves, etc.

Thus, after deducting the total material cost and expenses from cocoon production, we arrived at gross value added or surplus. This is the gross income generated from sericulture, which includes wages and salary and profit. It may be noted that in Dehradun, Saharanpur and Solan, hired labour has not been found in practice in sericulture activity. It appears that sericulture is fully a household husbandry activity, which is completely managed and undertaken by the members of the households. Thus, members of the households seem to have worked as entrepreneur-cum-manager-cum worker. Hence, gross value added generated from sericulture is a profit rather than wages.

Table III.5 gives gross profit and profit per unit in selected districts. Gross profit as well as profit per unit turns out to be highest in Dehradun, where as, lowest in Solan district. For example, gross profit is found to be Rs.8.05 lakhs in Dehradun, Rs.5.71 lakhs in Saharanpur and Rs.2.88 lakhs in Solan. Per unit profit turns out to be Rs.12,578.13 in Dehradun, Rs.9,066.67 in Saharanpur and Rs.3,600.00 in Solan. Thus, profit in Dehradun is higher by 1.41 times than that of Saharanpur and about 3 times than that of Solan. Similarly, profit per unit in Dehradun is higher by 1.39 times than Saharanpur and 3.49 times than that of Solan (Table III.5).

Table III.5 : Profit in Selected Districts; 1993-94

Districts	Profit (Rs. lakhs)	Profit per per unit (Rs.)
Dehradun	8.05	12,578.13
Saharnapur	5.71	9,066.67
Solan	2.88	3,600.00

Source : Based on primary data.

IV. Production : Some Discussion

We may now discuss the production of cocoons. This is examined on the basis of qualitative judgement, conditioned the leading questions asked to rearing households. Table III.6 gives responses of rearing households about the performance of production. In Dehradun and saharanpur, a majority of rearing households has expressed dissatisfaction about the performance of cocoon production. As much as 53 households (or 82.81 per cent) in Dehradun and 42 households (or 66.67 per cent) in Saharanpur reported poor performance of cocoon production. In Solan, however, a majority of rearing households (38 or 47.50 per cent) expressed the average performance in terms of cocoon production. Taking

Table III.6 : Responses of Rearing Households About the Level of Production

(No. of Household)

Districts	Good	Average	Bad	No Response	Total
Dehradun	6 (9.38)	3 (4.69)	53 (82.81)	2 (3.12)	64 (100.00)
Saharanpur	2 (3.17)	14 (22.22)	42 (66.67)	5 (7.94)	63 (100.00)
Solan	20 (25.00)	38 (47.50)	20 (25.00)	2 (2.50)	80 (100.00)
Total	28 (13.53)	55 (26.57)	115 (55.56)	9 (4.34)	207 (100.00)

Note : Figures in brackets denote percentage to total rearing households in respective district.

Source : Based on primary data

all districts together, the performance of cocoon production was found far from satisfaction. As much as 115 rearing households (or 55.56 per cent) were found dissatisfied in terms of performance of cocoon production. The finding, therefore, underlined the poor performance record of cocoon production in selected districts, which needs to be explained appropriately by various factors on internal supply and to that on external demand. It has, however, not been possible for us to capture all dimensions but we hope that main determining factors of production are not left out.

One of the major factor inter-alia is the disease that destroys the silk worms. Table III.7 summerises the responses of rearers on this aspect. It is reported that 53 households (or 82.81 per cent) in Dehradun; 52 households (or 82.54 per cent) in Saharanpur; and 67 households (or 83.75 per cent) in Solan have felt that diseases are the root cause of slowing down the production of cocoon through damaging the silk worms. In all, 172 households (or 83.09 per cent) have expressed that diseases have destroyed the crops of cocoon. Such diseases commonly found are Flacherie and Grasserie in selected districts. Table III.8 shows the differential impact of diseases felt by the rearers across the districts. In Dehradun, as much as 53 (or 98.15 per cent); in Saharanpur, 50 (or 96.15 per cent) households have felt that their crops are being destroyd by the Grasserie. In Solan, as much as 61 (or 91.04 per cent) households have expressed that major disease is the Flacherie, which continues to spoil their crops.

We also enquired about steps taken to fight diseases. Table III.9 records information on these aspects. It is seen that separation of diseased worm and dusting of R.K.O power are generally used to fight against diseases. Seperation of diseased worms is found to be more common in practive in selected districts. In all districts, 96 (or 46.38 per cent) of households applied seperation of diseased worm as an

Table III.7 : Responses of Rearers About the Diseases in the Worms

Districts	Yes	No	Total
Dehradun	53 (82.81)	11 (17.19)	64 (100.00)
Saharanpur	52 (82.54)	11 (17.46)	63 (100.00)
Solan	67 (83.75)	13 (16.25)	80 (100.00)
Total	172 (83.09)	35 (16.91)	207 (100.00)

Note : Figures in brackets denote percentage to total households in respective district.

Source : Based on primary data.

Table III.8: Responses of Rearer Households About the Type of Diseases

(No. of Households)

Districts	Type of diseases		
	Grasserie	Flacharie	Total
Dehradun	53 (98.15)	1 (1.85)	54 (100.00)
Saharanpur	50 (96.15)	2 (3.85)	52 (100.00)
Solan	6 (8.96)	61 (91.04)	67 (100.00)
Total	109 (63.00)	64 (37.00)	173 (100.00)

Note : Figures in brackets denote percentage to total

Source : Based on primary data.

Table III.9: Responses of Rearer Households to Fight Diseases

Districts	(No. of Household)		
	Separating diseased Worms	Dusting of R.K.O. power	Others
Dehradun	25 (39.06)	36 (56.25)	6 (9.38)
Saharanpur	31 (49.21)	27 (42.86)	27 (42.86)
Solan	40 (50.00)	20 (25.00)	30 (37.50)
Total	96 (46.38)	83 (40.10)	63 (30.43)

Note : Figures in brackets denote percentage to total

Source : Based on primary data.

effective method for fighting disease. Dusting of R.K.O powder has been followed by 40.10 per cent of rearers in all the selected districts.

Lack of advanced technique appears to be another factor, which seems to have affected the rearing and production of cocoon. Table-III.10 illustrates this point. It is discovered that in Dehradun, 33 rearer households (or 51.56 per cent) have acquired technique of mulberry farming from neighbour, while 54 (or 85.71 per cent) in Saharanpur and 63 households (or 78.75 percent) in Solan from the Government. In all, 56 households (or 27.05 per cent) have

Table III.10 : Responses of Rearer Households About the Acquisition of Technique of Mulberry Farming and Silk-worm Rearing

Districts	(No. of Household)			
	Neighbour	Govt. silk extension office	Family	Total
Dehradun	33 (51.56)	26 (40.63)	5 (7.81)	64 (100.00)
Saharanpur	7 (11.11)	54 (85.71)	2 (3.18)	63 (100.00)
Solan	16 (20.00)	63 (78.75)	1 (1.25)	80 (100.00)
Total	56 (27.05)	143 (69.08)	8 (3.87)	207 (100.00)

Note : Figures in brackets devote percentage to total households in respective district.

Source : Based on primary data.

acquired technique from neighbour, while 143 households (or 69.08 per cent) from the government. It is, however, surprising that import of technique either outside of the country or from sericulturally developed states, like, Karnataka, Andhra Pradesh and West Bengal is found to be non-existent in Sericulture in Dehradun, Saharanpur and Solan. This suggests that use of improved technique available elsewhere has not been applied in selected districts. This part of analysis, thus, suggests that rearing of cocoons has been affected by diseases on the one hand and on the other

lack of advanced technology. Generally, locally available obsolete technique from the neighbour and government has been found in common practice in sericulture activity.

V. Marketing of Cocoons : Constraints and Problems

Marketing of cocoons is an important activity in silk-worm rearing. It becomes important because in non-traditional mulberry cultivating areas, diversified market sources have not been developed as yet. In particular, the purchase of cocoons by private traders or private rearing units is very negligible. It is observed during the field investigation that most of the cocoons are purchased by government through Technical Service Centres or purchased from the market at predecided prices.

The data as given in Table III.11 on production, marketing and channels of marketing of cocoons show that around 81 per cent of total cocoon production is sold. The sale output ratio is higher by 5 per cent in Solan but lower by 2 per cent in Saharanpur. It is further evident that whatever quantity of cocoon is marketed, all are purchased by the government. There is no other channel of cocoon marketing in either of three sample districts. It is reported by the rearers in all three districts that

Table III.11: Production and Marketing of Cocoons in Selected Districts : 1993-94

(Rs. lakhs)			
Districts	Cocoons produced	Cocoons sold	Sources of marketing
			Government
1. Dehradun	36.96 (100.00)	29.94 (81.00)	29.94
2. Saharanpur	6.16 (100.00)	4.87 (79.00)	4.87
3. Solan	2.98 (100.00)	2.56 (86.00)	2.56
All	46.10 (100.00)	37.37 (81.06)	

Note : Figures in brackets denote percentage to total cocoon production.

Source: Based on primary data.

marketing is a serious problem. They are bound to visit TSCs or marketing centres many times. The problem of marketing includes: underweighting, lower grading, fixing low prices and considerable delay in payment. Consequently, many rearers have reported that they are no longer interested to carry on silk worm rearing, in selected districts.

VI. Contribution of Sericulture in Income and Employment

We may now discuss the contribution of sericulture appropriately. It has been examined by working out the contribution of income and employment from sericulture as a per cent of total income and employment of sericulturists. Such information is recorded in table IV.12. The income from sericulture accounts for 28.06 per cent in Dehradun; 15.86 per cent in Saharanpur; and 13.03 per cent in Solan. In all selected districts, average income contribution from sericulture comes to 20.76 per cent of sericulturist's total income. More or less, a similar situation has also emerged in case of employment. Employment from sericulture accounts for 28.22 per cent in Dehradun; about 30 per cent in Saharanpur; and about 28 per cent in Solan, of total employment of sericulturist households. On an average, employment from sericulture comes to 28.72 per cent, of total persons employed in sericulturist's household in the selected districts. It appears that sericulture is a secondary activity in the household in terms of income and employment generation.

Information based on qualitative judgement of sericulturist households partially supports the above finding. We find that about four-fifths of sericulturist

Table III.12 : Contribution of Income and Employment from Sericulture in Selected Districts : 1993-94

Districts	Income from sericulture as per cent of total income of sericulturist household	Employment from sericulture as a per cent of total household employment
Dehradun	28.06	28.22
Saharanpur	15.86	29.91
Solan	13.03	27.80
Total	20.76	28.72

Source : Based on primary data.

households in Dehradun, over three-fifths in Saharanpur and four-fifths in Solan are not keen in increasing the area under mulberry cultivation. In all selected districts, over 75 per cent of sericulturist households are not found interested for increasing the area under mulberry cultivation (Table III.13). This seems to suggest that these households are likely to switch over from sericulture to non-sericulture activities. This may be further confirmed by examining the responses articulated by non-sericulturists.

Table III.13 : Responses of Sericulturist Households for Increasing the Area Under Mulberry

Districts	(No. of Household)			
	Yes	No	No response	Total
Dehradun	10 (15.63)	51 (79.69)	3 (4.68)	64 (100.00)
Saharanpur	8 (12.70)	41 (65.08)	14 (22.22)	63 (100.00)
Solan	4 (5.00)	64 (80.00)	12 (15.00)	80 (100.00)
Total	22 (10.63)	156 (75.36)	29 (14.01)	207 (100.00)

Note : Figures in brackets denote percentage to total household in respective district.

Source : Based on primary data.

VII. Non-Sericulturists : Perceptions About Sericulture

As explained in the methodology, we have selected 8 non-sericulturists from each district of Dehradun, Saharanpur and Solan. The objective is to get an idea about their demographic features and perceptions about the various aspects of sericulture activity being carried out in their villages. Collected data on these aspects have been tabulated and analysed.

VII.1 Population and Average Family Size

In each district, 8 non-sericulturists have been interviewed. Population of selected households comes to 37 in Dehradun, 42 in Saharanpur and 43 in Solan. Total population of non-sericulturists in the aggregate sample comes to 122 persons. There are minor variation in the average family size across the district. In Dehradun, the family size is 4.63, in Saharanpur 5.25 and in Solan 5.38. The average family size comes to 5.08 of the total sample. District-wise population and average family size of non-sericulturists have been shown in table III.14.

Table III.14 : Population and Average Family Size of Non-Sericulturists in Selected Districts

Districts	Population	Average Family Size
Dehradun	37	4.63
Sharanpur	42	5.25
Solan	43	5.38
Total	122	5.08

Source : Based on primary data.

VII.2 Participation of Workers in Different Activities

It is a fact that working population in rural areas of our country is not only confined in one activity but also workers do multiple activities. Thus, if the participation of workers is enquired, it would portray their engagement in multiple activities. Same is the case with our sample of non-sericulturists as evident from the table III.15. Agriculture is found to be the main activity in Dehradun and Saharanpur districts of U.P., where about 36 per cent and over 35 per cent of workers are engaged. In Solan district, cattle and animal care is found to be the most important activity, in which over 34 per cent of workers are involved. Cattle and animal care in Dehradun and Saharanpur and agriculture in Solan has been found to be second important activity. Household work stood at third place in the selected districts (Table III.15).

Table III.15 : Participation of Workers in Different Activities in Selected Districts

Districts	Agriculture	Cattle & animal care	Other enterprises	Child care	Household work	Total
Dehradun	24 (35.82)	25 (37.31)	6 (8.96)	2 (2.99)	10 (14.92)	67 (100.00)
Saharanpur	26 (35.14)	23 (31.08)	8 (10.81)	5 (6.67)	12 (16.21)	74 (100.00)
Solan	29 (30.20)	33 (34.38)	16 (16.67)	-	18 (18.75)	96 (100.00)
Total	79 (33.33)	81 (34.18)	30 (12.66)	7 (2.95)	40 (16.88)	237 (100.00)

Note : Figures in brackets denote percentage to total household in respective district.

Source : Based on primary data.

VIII.3 : Perceptions by Non-Sericulturists About Sericulture

In the preceding analysis we tried to unearth the problems faced by sericulturists from rearing to marketing. It is equally important if perceptions of non-sericulturists are enquired from them on various aspects of sericulture. Certain enquiries are, therefore, made from non-sericulturists on suitability of their land for mulberry

cultivation, technicalities of mulberry cultivation, market, profitability, labour employment, silk-worm rearing, etc. The answers given by non-sericulturist households have been recorded in table III.16.

In Dehradun, Saharanpur and Solan, all non-sericulturists are of the opinion that their land is suitable for mulberry cultivation. This is discussed in detail under section VII.5. As far the market, out of total non-sericulturists, around 88 per cent in Solan, 25 per cent in Dehradun and 13 per cent in Saharanpur held the view that only average market exists for cocoon. At the aggregate sample around 42 per cent of non-sericulturists have maintained such view. Also, hundred per cent of sample non-sericulturists have expressed the view that those involved in it get less price and 75 per cent of them feel that sericulture is less profitable activity. This is true for about 88 per cent of non-sericulturists in Saharanpur 75 per cent in Dehradun and about 63 per cent in Solan district. All the non-sericulturists are of the opinion that sericulture requires hard work and training from mulberry cultivation and for silk-worm rearing. All the non-sericulturists maintains the view that silk-worm farming gives bad smell all the time and hence it is not a socially desirable and respectable activity. Hence, it appears that misconceptions in the

Table III.16 : Perceptions of Non-Sericulturists About Sericulture Activity

(No. of household)

Districts	Suitability land for mul- berry cultiva- tion		Market and Price				
	Good	Not Suit- table	Good	Avera- ge	Profi- table	Less Profi- table	Low Price
Dehradun	8 (100.00)	-	-	2 (25.00)	-	6 (75.00)	8 (100.00)
Saharanpur	8 (100.00)	-	-	1 (12.50)	-	7 (87.50)	8 (100.00)
Solan	8 (100.00)	-	-	7 (87.50)	-	5 (62.50)	8 (100.00)
Total	24 (100.00)	-	-	10 (41.67)	-	18 (75.00)	24 (100.00)

Table III.16 contd...

Districts	Labour employment			Technicalities of mulberry cultivation		Silk worm rearing			
	Delay in payment	More man-power needed	Hard work	Easy to do	Training is needed	Need of training	Bad smelling	Difficult and is not good to start	
Dehradun	-	-	-	8 (100.00)	-	8 (100.00)	8 (100.00)	8 (100.00)	6 (75.00)
Saharanpur	-	-	-	8 (100.00)	-	8 (100.00)	8 (100.00)	8 (100.00)	7 (87.50)
Solan	-	-	-	8 (100.00)	-	8 (100.00)	8 (100.00)	8 (100.00)	8 (100.00)
Total	-	-	-	24 (100.00)	-	24 (100.00)	24 (100.00)	24 (100.00)	24 (100.00)

Note : Figures in brackets denote percentage to total non-sericulturists.

Source: Based on primary data.

mind of non-sericulturists about the silk-worm rearing in areas of U.P. and H.P. exist, which must be duly taken care of before planning for sericulture development in these areas.

VII.4 : Availability of Government Help : Non-Sericulturist views

A substantial number of non-sericulturists in the sample districts appeared to have knowledge about the government help for development of sericulture. This is given in table III.17. It is found that around 88 per cent of non-sericulturists are aware about the availability of government help to start sericulture. This level of awareness is hundred per cent in Saharanpur followed by Dehradun (87.50 per cent) and Solan (75 per cent).

As for the type of helps available from the government is concerned, 39 per cent of non-sericulturists in all districts reported the availability of training. In Solan, 50 per cent of non-sericulturists have knowledge about the training facility followed by 41.8 per cent in Saharanpur and 31.25 per cent in Dehradun. The availability of loan appears second in order of importance, about which over 31 per cent in Dehradun, over 23 per cent in Saharanpur and 25 per cent in Solan are aware of. About 27 per cent of non-sericulturists in all districts are aware of the loan

Table III.17: Perceptions of Non-Sericulturists About the Availability of Government Help for Sericulture

Districts	(No. of Household)		
	Availability of government help		
	Yes	No	Total
Dehradun	7 (87.50)	1 (12.50)	8 (100.00)
Saharanpur	8 (100.00)	-	8 (100.00)
Solan	6 (75.00)	2 (25.00)	8 (100.00)
Total	21 (87.50)	3 (12.50)	24 (100.00)

Note : Figures in brackets denote percentage to total.

Source: Based on primary data.

facility. The availability of seeds comes third in order of importance, about which non-sericulturists are well aware of. It is evident that around 20 per cent of non-sericulturists know that seeds are available from the government. The knowledge about the availability of trays is seen to be roughly 13 per cent in Solan, 12 per cent in Saharanpur and over 6 per cent in Dehradun. Over 12 per cent of non-sericulturists of Dehradun are also aware about the help in

terms of medicines available from the government. However, non-sericulturists in Saharanpur and Solan completely lack this information. In general, the data reveals a high level of awareness among non-sericulturists about the availability of government help. However, such facilities and helps offered by government are seen unavailed by non-sericulturists. Table III.18 provides detailed information on the perceptions of non-sericulturists across the districts.

Table III.18 : Perceptions of Non-Sericulturists About the Type of Help Available from the Government

(No. of Household)							
Districts	Training	Seed	Tray	Medi- cine	Loan	Others	Total
Dehradun	5 (31.25)	3 (18.75)	1 (6.25)	2 (12.50)	5 (31.25)	-	16 (100.00)
Saharanpur	7 (41.18)	4 (23.53)	2 (11.76)	-	4 (23.53)	-	17 (100.00)
Solan	4 (50.00)	1 (12.50)	1 (12.50)	-	2 (25.00)	-	8 (100.00)
Total	16 (39.02)	8 (19.51)	4 (9.76)	2 (4.88)	11 (26.83)	-	41 (100.00)

Note : Figures in bracket denotes percentate to total non-sericulturst household.

Source : Based on primary data.

VII.5 Suitability of Land and Non-cultivation of Mulberry:
Non-Sericulturist Views

It was felt essential to enquire from non-sericulturists about the suitability of land plot for mulberry cultivation. Such Information on such aspects has been recorded in table IV.19. It is evident that 75 per cent of total non-sericulturists feel that any of their plots of their land is suitable for mulberry cultivation in the aggregate sample. At the district level, it is true for about 88 per cent of non-sericulturists in Dehradun, 75 per cent in Saharanpur and about 63 per cent in Solan.

Despite above, most of non-sericulturists did not take up mulberry cultivation. In order to understand this, reasons given by non-sericulturists of Dehradun, Saharanpur and Solan have been listed in table III.20. Most of the reasons given by them confirms the lack of proper understanding about the entire sericulture farming activity. This is true for non-sericulturists of the Dehradun, Saharanpur and Solan.

Table III.19 : Perceptions of Non-Sericulturists About Suitability Land Plot for Mulberry Cultivation

Districts	(No. of Household)		
	Yes	No	Total
Dehradun	7 (87.50)	1 (12.50)	8 (100.00)
Saharanpur	6 (75.00)	2 (25.00)	8 (100.00)
Solan	5 (62.50)	3 (37.50)	8 (100.00)
Total	18 (75.00)	6 (25.00)	24 (100.00)

Source : Based on primary data.

Table III.20 : Perceptions of Non-Sericulturists About Non-Cultivation of Mulberry

Districts		
Dehradun	Saharanpur	Solan
1. No interest	1. Less income	1. No knowledge about govern-
2. Less income	2. Hard labour is required	ment scheme
3. Socially not good	3. Socially not good	2. Socially not
4. Not good market	4. No proper help from government	good
5. No knowledge		

Source : Based on responses from non-sericulturists.

VIII. Concluding Observations

Present chapter generates the base line data and examines productivity, income and employment generation and production and marketing aspects of sericulture. Apart from above, it also discusses the responses non-sericulturists about the potential and prospect for starting the sericulture. Finding suggests that productivity is highest in Dehradun, while lowest in Solan. Share of gain analysis also indicates that gross profit as well as profit per unit is highest in Dehradun, while lowest in Solan. As for the production, the performance of cocoon production is found to be depressing, which is accounted by the diseases and obsolete technique deployed in sericulture activity. Also, cocoon production is sold exclusively to the government department. Quite often, depressed prices of cocoon, delay in payment and underweighting have been reported as major problems of marketing of cocoons.

Sericulture activity in selected districts is found secondary in terms of generation of income and employment for the households. Sericulturists are, therefore, unwilling to increase the area under mulberry. Similarly, non-sericulturists also feel that sericulture is economically nonviable due to lower profit margin than other activities. Most of the non-sericulturists reported lack of training as a

major constraint for starting sericulture, yet they have knowledge about the helps and incentives available from the government. Misconception also prevails among the non-sericulturist households, who feel that such activity is primarily socially undesirable and unrespectable as it gives bad smelling. It may, however, be mentioned that despite low income and employment potential, a sizeable proportion of women is also employed in sericulture. In the coming chapter IV, we will discuss the participation and perception of women engaged in sericulture in selected districts.

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CHAPTER IV

WOMEN IN SERICULTURE : PARTICIPATION AND PERCEPTION

I. Introduction

The role that women play in the process of economic development has been well recognised in the early literature on development. The contribution of women in sericulture has generally been recognised to be more significant than that of men. Female workers as a ratio of male workers are considered to be 1.4177 in West Bengal, 1.1488 in Karnataka and 1.3135 in Mysore. Sericulture in India employs 27.54 lakhs of female workers or about 51 per cent of female labour force. The absorption of women in sericulture is, however, likely to be different across different sericulture activities and states, which, to a large extent, is a result of various socio-economic characteristics of women and their acquired skills. In the light of above, present chapter examines : (1) the contribution of women vis-a-vis the men, (2) employment of women vis-a-vis the men, (3) educational background of women vis-a-vis men and (4) views of women about their importance in sericulture activity.

II. Sericulturist Households : Population Structure and Sex Composition

Table IV.1 provides an insight into the population composition of sericulturist households. It provides information on population of males and females and average size of household. The total population of sericulturist households in Dehradun comes to 296 consisting of 161 males and 135 females. The proportion of males population works out to be 54.39 per cent and females to 45.61 per cent, of total sericulturist's population. The average size of family of sericulturists works out to be 4.62. The total population of sericulturist households comes to 344 in Saharanpur, comprising of 191 males and 153 females, which in percentage term comes to 55.52 and 44.48 respectively. The average size of a sericulturist household works out to be 5.46. In case of Solan, the population of sericulturist households comes to 408, of which 231 are males, and 177 females. The percentage of males to total sericulturist's population comes to 56.62 and that for females to 43.38. The average family size of sericulturists comes to 5.10.

In all, total population of sericulturist households comes to 1048, which consists of 583 males and 465 females. Of total sericulturist's population, 55.63 per cent are males, and 44.37 per cent females. The average size of

Table IV.1 : Sex-wise Population in Selected Districts and Average Household Size

Districts	Population			Average house- hold size
	Male (No.)	Female (No.)	Total (No.)	
Dehradun	161 (54.39)	135 (45.61)	296 (100.00)	4.62
Saharanpur	191 (55.52)	153 (44.48)	344 (100.00)	5.46
Solan	231 (56.62)	177 (43.38)	408 (100.00)	5.10
Total	583 (55.63)	465 (44.37)	1048 (100.00)	5.06

Note : Figures in brackets denote percentage to total population of households in respective district.

Source: Based on Primary data.

family of sample sericulturists comes to 5.06 (Table IV.1). This suggests that male population dominates over female population in sericulture activity in selected districts. As for the average size of family, it is highest in Saharanpur but lowest in Dehradun.

III. Sericulture Workers : Sex and Caste Composition

It has generally been believed that absorption of female is larger than the male in sericulture activity. It is quite likely in traditional mulberry growing states of Karnataka, West Bengal and Mysore which may not be the same in non-traditional states of Uttar Pradesh and Himachal Pradesh. Table IV.2 distributes sericulture workers into males and females. The male sericultural workers dominates in all districts. Of total sericultural workers, 118 are males and 112 females in Dehradun, which comes to 57.30 per cent and 48.70 per cent. A similar is also the case in Saharanpur, where male workers are 115 and female 109 accounting for 51.34 per cent and to 48.66 per cent, of the total sericultural workers. In Solan, male workers are 75 and female 69 accounting for 52.08 per cent and 47.92 per cent respectively, of total sericultural workers.

In all the three districts, the proportion of male workers comes to 51.51 per cent, while female workers to 48.49 per cent. It implies that sericulture activity employs more male than the female workers in sample districts. Such a finding is also seen corroborated by the ratio of female to male workers engaged in sericulture activity, which comes to

Table IV.2 : Distribution of Sericulture Workers into Males and Females in Selected Districts

Districts	Workers			Female worker as a ratio of male worker
	Male (No.)	Female (No.)	Total (No.)	
Dehradun	118 (51.30)	112 (48.70)	230 (100.00)	0.9491
Saharanpur	115 (51.34)	109 (48.66)	224 (100.00)	0.9478
Solan	75 (52.08)	69 (47.92)	144 (100.00)	0.9200
Total	308 (51.51)	290 (48.49)	598 (100.00)	0.9416

Note : Figures in brackets denote percentage to total workers in respective district.

Source : Based on primary data.

0.9491 in Dehradun, 0.9478 in Saharanpur, 0.9200 in Solan and 0.9416 in all districts considered in the study.

An important reason for the greater participation of male workers could be the caste-wise involvement of workers in sericulture activity. Table IV.3 records information on sericulture workers according to sex and caste. It is found

Table IV.3 : Distribution of Sericulture Workers According to Sex and Caste in Selected Districts

Districts	S.C.			S.T.			Others			Total		
	Male (No.)	Female (No.)	Total (No.)	Male (No.)	Female (No.)	Total (No.)	Male (No.)	Female (No.)	Total (No.)	Male (No.)	Female (No.)	Total (No.)
Dehradun	8 (6.78)	11 (9.82)	19 (8.26)	75 (65.55)	53 (47.32)	128 (55.65)	35 (29.67)	48 (42.85)	83 (36.09)	118 (100.00)	112 (100.00)	230 (100.00)
Saharanpur	61 (53.04)	57 (52.29)	118 (52.68)	21 (18.27)	16 (14.68)	37 (16.52)	33 (28.69)	36 (33.03)	69 (30.80)	115 (100.0)	109 (100.00)	224 (100.00)
Solan	24 (32.00)	18 (26.09)	42 (29.17)	1 (1.33)	1 (1.45)	2 (1.39)	50 (66.67)	50 (72.46)	100 (69.44)	75 (100.00)	69 (100.00)	144 (100.00)
Total	93 (30.19)	86 (29.66)	179 (29.93)	97 (31.49)	70 (24.14)	167 (27.93)	118 (38.32)	134 (46.20)	252 (42.14)	308 (100.00)	290 (100.00)	598 (100.00)

Note : Figures in brackets denote percentage to total workers in respective district.

Source : Based on primary data.

that in Dehradun, female workers are more (11) than the male workers (8) in case of scheduled castes; male workers (73) more than the female workers (53) in scheduled tribes; female workers more (48) than the male workers (35) in non SC/ST caste. In Saharanpur, employment in sericulture is mainly dominated by male workers in scheduled castes and scheduled tribes, while reverse is the case in non-SC/ST community. In Solan, male workers are more (24) than the female workers (18) in scheduled castes; equal number of male and female worker (1) in scheduled tribes and other community (50). In all districts together, it is found that participation of male workers is more (93) than the females (86) in SC followed by ST, (97 males and 70 females) but a reverse is the case for other communities (118 males and 134 females).

The absorption of employment across castes becomes more crystallly clear from table IV.4. It is found that female employment is dominant in case of other communities as the female/male ratio comes to 1.3714 in Dehradun, 1.0909 in Saharanpur and 1.1356 in the selected districts as a whole. However, female/male ratio comes equal in Solan district (1.0000).

As compared to above, female employment is less significant in SC/ST as female/male employment ratio comes to 0.7711 in Dehradun, 0.8902 in Saharanpur, 0.7600 in Solan and 0.8211 in all sample districts. Thus, larger participation

Table IV.4 : Ratio of Female Workers to Male Workers in Different Castes in Selected Districts

Districts	S.C.	S.T.	Non-S.C/S.T	Others
Dehradun	1.3750	0.7067	0.7711	1.3714
Saharanpur	0.9344	0.7619	0.8902	1.0909
Solan	0.7500	1.0000	0.7600	1.0000
All	0.9247	0.7215	0.8211	1.1356

Source : Based on primary data.

by male workers in Dehradun has mainly been due to the employment absorption from the ST community; in Saharanpur from SC and ST both; in Solan from the scheduled castes alone; and in all districts from the SC and ST communities as a whole.

IV. Educational Background

Sericulture predominantly involves SC/ST communities, which are said to be under privileged socially and economically. This leads to their low level of education as a result of their poor socio-economic conditions. Table IV.5 gives educational level in relation to members of the

Table IV.5 : Educational Background of Members of Households in Selected Districts

Districts	Illiterate			Upto primary			Upto VIII standard			Upto X standard		
	Male (No.)	Female (No.)	Total (No.)	Male (No.)	Female (No.)	Total (No.)	Male (No.)	Female (No.)	Total (No.)	Male (No.)	Female (No.)	Total (No.)
Dehradun	45 (27.95)	72 (53.34)	117 (39.53)	87 (54.03)	47 (34.81)	134 (45.27)	14 (8.70)	6 (4.44)	20 (6.76)	14 (8.70)	7 (5.19)	21 (7.09)
Saharanpur	60 (31.41)	93 (60.79)	153 (44.48)	43 (22.51)	33 (21.59)	76 (22.09)	27 (14.14)	15 (9.80)	42 (12.21)	36 (18.85)	8 (5.23)	44 (12.79)
Solan	138 (59.75)	119 (67.25)	257 (62.99)	30 (12.98)	31 (17.51)	61 (14.95)	22 (9.52)	15 (8.47)	37 (9.07)	27 (11.69)	7 (3.95)	34 (8.33)
Total	243 (41.67)	284 (61.07)	527 (50.28)	160 (27.44)	111 (23.87)	271 (25.86)	63 (10.81)	36 (7.74)	99 (9.45)	77 (13.21)	22 (4.73)	99 (9.45)

Table IV.5 Contd...

Districts	Upto XII standard			Graduate and above			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
	(No.)	(No.)	(No.)	(No.)	(No.)	(No.)	(No.)	(No.)	(No.)
Dehradun	1 (0.62)	2 (1.48)	3 (1.01)	-	1 (0.74)	1 (0.34)	161 (100.00)	135 (100.00)	296 (100.00)
Saharanpur	20 (10.47)	4 (2.61)	24 (6.98)	5 (2.62)	-	5 (1.45)	191 (100.00)	153 (100.00)	344 (100.00)
Solan	9 (3.90)	3 (1.69)	12 (2.94)	5 (2.16)	2 (1.13)	7 (1.72)	231 (100.00)	177 (100.00)	408 (100.00)
Total	30 (5.15)	9 (1.94)	39 (3.72)	10 (1.72)	3 (0.65)	13 (1.24)	583 (100.00)	465 (100.00)	1048 (100.00)

Note : Figures in brackets denote per cent to total population of sericulturist households.

Source : Based on primary data.

households in selected districts. It is found that over 50 per cent, of total population of sericulturists, is illiterate in the aggregate sample of Dehradun, Saharanpur and Solan. Around one-fourth is educated upto the primary level. The level of education of females is found to be lower as compared to males. Illiteracy in females is as high as 61 per cent against over 42 per cent in males in the total sample. At inter-district level, the level of education is higher in Dehradun as compared to Saharanpur and Solan districts. Total illiterates of total population of sericulturists come to around 40 per cent in Dehradun as against over 44 per cent in Saharanpur and about 63 per cent in the Solan district. Illiteracy among females of total population of sericulturists, is also found lower being over 53 per cent in Dehradun as compared to around 61 per cent in Saharanpur and over 67 per cent in Solan.

Over 45 per cent of population, of sericulturist households in Dehradun, are educated upto primary level, 22 per cent in Saharanpur and about 15 per cent in the Solan. This is, however, not true with respect to education upto the VIIIth standard, which is about 7 per cent in Dehradun as compared to over 12 per cent in Saharanpur and 9 per cent in Solan. Such level of education for female is found lower than male, being 4.4 per cent as against of male of 8.70 per cent in Dehradun; 9.80 per cent and 14.14 per cent in Saharanpur; and 8.47 per cent and 9.52 per cent in Solan.

This is also true for the education upto 10th standard. Male population is found more educated than the females. In Dehradun, male education comes to 8.70 per cent and female to 5.19 per cent; in Saharanpur 18.85 per cent and 5.23 per cent; and in Solan 11.69 per cent and to 3.95 per cent. The male and female population, of total sericulturist population, received education upto 12th standard, comes to 0.62 per cent and 1.48 per cent in Dehradun; 10.47 per cent and 2.61 per cent in Saharanpur; and 3.90 per cent and 1.69 per cent in Solan.

The level of education upto graduate and above has, however, been found to be insignificant in case of Dehradun (i.e., 0.74 per cent in case of female population only). In sharp contrast to this, 2.62 per cent of male population in Saharanpur and 2.16 per cent in Solan, of the total population of sericulturist households, are found having education upto graduate and above. It, thus, suggests that population of sericulturists are more educated in Dehradun as compared to Saharanpur. However, the proportion of educated population, of total sericulturist population, is found decelerating with the increase in level of education in Dehradun as compared to Saharanpur and Solan. The pattern of female literacy also underlines a similar finding across the districts. Also, illiteracy is significantly higher among females than males in the aggregate sample.

V. Engagement of Sericulture Workers in Different Activities

Sericultural workers do not perform a single activity. They simultaneously work in multiple activities like, agriculture, sericulture, animal husbandry etc. to earn income from different sources to supplement their family income. The employment pattern, thus, indicates the importance of different activities for sericultural workers. Such an analysis would suggest the vitality of sericulture being adopted by the sericulturist families in selected districts. The data on engagement of sericultural workers across different activities in Dehradun, Saharanpur and Solan are given in table IV.6.

It is found that over 28 per cent of workers of the total sericultural workers, are engaged in sericulture in Dehradun. The corresponding figure comes to around 30 per cent in Saharanpur and around 28 per cent in Solan. Thus, sericulture appears to be as main economic activity in Dehradun, Saharanpur and Solan, which together employed 28.72 per cent of sericultural workers. Agriculture stood second in order of importance, where over 24 to 25 per cent, of workers of total sericultural workers, were engaged in Dehradun, Saharanpur and Solan. Animal care appeared as third important activity, in which 22.21 per cent in

Table IV.6 : Distribution of Workers By Sex and Economic Activities in Different Districts

Districts	Sericulture			Agriculture			Animal Care			Other enterprises		
	Male (No.)	Female (No.)	Total (No.)	Male (No.)	Female (No.)	Total (No.)	Male (No.)	Female (No.)	Total (No.)	Male (No.)	Female (No.)	Total (No.)
Dehradun	118 (29.72)	112 (26.78)	230 (28.23)	103 (25.94)	96 (22.97)	199 (24.41)	98 (24.69)	83 (19.80)	181 (22.21)	6 (1.51)	3 (0.72)	9 (1.10)
Saharanpur	115 (30.50)	109 (29.30)	224 (29.91)	113 (29.97)	76 (20.43)	189 (25.23)	97 (25.73)	53 (14.25)	150 (20.03)	2 (0.53)	1 (0.27)	3 (0.40)
Solan	75 (29.76)	69 (25.93)	144 (27.80)	69 (27.38)	58 (21.80)	127 (24.52)	62 (24.60)	53 (19.92)	115 (22.20)	7 (2.78)	1 (0.38)	8 (1.54)
Total	308 (30.02)	290 (27.46)	598 (28.72)	285 (27.78)	230 (21.78)	515 (24.74)	257 (25.05)	189 (17.89)	446 (21.42)	15 (1.46)	5 (0.47)	20 (0.96)

Table IV.6 Contd....

District	Child Care			Household work			Wage Labour			Total		
	Male (No.)	Female (No.)	Total (No.)	Male (No.)	Female (No.)	Total (No.)	Male (No.)	Female (No.)	Total (No.)	Male (No.)	Female (No.)	Total (No.)
Dehradun	-	22	22	3	97	100	69	5	74	397	418	815
		(5.26)	(2.70)	(0.76)	(23.21)	(12.27)	(7.38)	(1.20)	(9.08)	(100.00)	(100.00)	(100.00)
Saharanpur	-	25	25	3	100	103	47	8	55	377	372	749
		(6.72)	(3.34)	(0.80)	(26.88)	(13.75)	(12.47)	(2.15)	(7.34)	(100.00)	(100.00)	(100.00)
Solan	1	20	21	5	58	63	33	7	40	252	266	518
	(0.39)	(7.52)	(4.05)	(1.99)	(21.80)	(12.16)	(13.10)	(2.65)	(7.73)	(100.00)	(100.00)	(100.00)
Total	1	67	68	11	255	266	149	20	169	1026	1056	2082
	(0.01)	(6.34)	(3.27)	(1.07)	(24.17)	(12.78)	(14.58)	(1.89)	(8.11)	(100.00)	(100.00)	(100.00)

Note : Figures under brackets denote percentage to total sericulture workers.

Source : Based on primary data.

Dehradun, 22.20 per cent in Solan and 20.03 per cent in Saharanpur, of total sericultural workers were engaged. The remaining activities, however, were found to be of marginal significance.

Table IV.6 classifies in to male and female, of total sericultural workers, engaged in different economic activities. It is found that male workers in sericulture activity are more significant (30.02 per cent) than the female workers (27.46 per cent) in sample districts. Next in order of importance comes to agriculture, wherein 27.78 per cent of male and 21.78 per cent of female workers are employed. The corresponding percentages of male and female workers, are 25.05 per cent and 17.89 per cent in animal care; 1.07 per cent and 24.17 per cent household work; 14.58 per cent and 1.89 per cent wage based work; 0.01 per cent and 6.34 per cent child care; and 1.46 per cent and 0.47 per cent in other enterprises respectively. It emerges that male employment is more important than the female in sericulture, agriculture, wage based work and animal care. Across the districts, male workers, of total sericulture workers, found to be significant in sericulture, being about 30 per cent in Dehradun, 31 per cent in Saharanpur and about 30 per cent in Solan. In agriculture, the corresponding percentages come to over 27, about 26 and 30 respectively.

As for the female employment is concerned, it is found to be more significant than male employment in household work and child care. Household work, of total sericultural workers, employed over 24 per cent of female workers as against male workers of 1.07 per cent and child care 6.34 per cent as compared to 0.01 per cent in the aggregate sample. The corresponding proportion of female and male workers, in household work comes to 23.21 per cent and 0.76 per cent in Dehradun; 26.88 per cent and 0.80 per cent in Saharanpur; and 21.80 per cent and 1.99 per cent in Solan. The corresponding percentages in child care are found to be 7.52 and 0.39 in Solan. In Dehradun and Saharanpur male workers do not exist in child care activity, which is exclusively dominated by female workers. Thus, it emerges that sericulture, agriculture, animal care and wage based work are generally dominated by male workers, while household work and child care by female workers. This is true across the selected districts and in the aggregate sample as well.

VI. Participation of Workers in Sericulture Enterprise

Earlier section examined the involvement of family workers in different activities in selected districts. We may now come to examine the engagement of sericultural workers in sericulture activity from production to marketing.

We collected information on nature of participation of workers in farming, rearing, marketing, etc. of sericulture activities. Table IV.7 records information on above aspects.

It is found that about 27 per cent of sericultural workers are owner of the enterprise in the total sample. A similar pattern is also seen at the inter-district level. However, only 17 per cent of the total female sericulturist workers of Dehradun are found as owners as against 38 per cent observed in Solan district. However, female workers in Saharanpur as owner of sericulture do not exist at all. The silk-worm rearing is the activity, where the largest proportion of workers i.e., 29 per cent in sample are involved. The females engagement in this activity is found to be 35 per cent as against 28 per cent of males in the sample. A higher female involvement in rearing is evident in Dehradun and Solan as compared to Saharanpur. As for the marketing of cocoons, one-fourth of the total workers are found involved at the inter-district levels. The involvement of females in marketing is found to be more in Dehradun and Saharanpur districts of Uttar Pradesh as compared to Solan district of Himachal Pradesh.

VII. Employment Hours and Employment Per Worker

Employment of workers in various activities depends upon the type of sericulture activities. There are some sericulture activities, which need more working hours like

Table IV.7 : Sex-wise Distribution of Workers in Different Sericulture Activities in Selected Districts

	Workers engaged in:								
	As owning of enter- prise			Farming			Rearing		
Districts	Male (No.)	Female (No.)	Total (No.)	Male (No.)	Female (No.)	Total (No.)	Male (No.)	Female (No.)	Total (No.)
Dehradun	52 (26.13)	1 (16.67)	53 (25.85)	52 (26.13)	-	52 (25.37)	51 (25.62)	3 (50.00)	54 (26.34)
Saharanpur	51 (27.87)	-	51 (26.43)	41 (22.40)	-	41 (21.24)	51 (27.87)	2 (20.00)	53 (27.46)
Solan	31 (25.62)	9 (37.50)	40 (27.59)	14 (11.57)	2 (8.33)	16 (11.03)	41 (33.88)	9 (37.50)	50 (34.48)
Total	134 (26.64)	10 (25.00)	144 (26.53)	107 (21.27)	2 (5.00)	109 (20.07)	143 (28.43)	14 (35.00)	157 (28.91)

Table IV.7 Contd...

Districts	Marketing			Total		
	Male (No.)	Female (No.)	Total (No.)	Male (No.)	Female (No.)	Total (No.)
Dehradun	44 (22.11)	2 (33.33)	46 (22.4)	199 (100.00)	6 (100.00)	205 (100.00)
Saharanpur	40 (21.86)	8 (80.00)	48 (24.8)	183 (100.00)	10 (100.00)	193 (100.00)
Solan	35 (28.67)	4 (16.67)	39 (26.9)	121 (100.00)	24 (100.00)	145 (100.00)
Total	119 (23.66)	14 (35.00)	133 (24.4)	503 (100.00)	40 (100.00)	543 (100.00)

Note : Figures, in brakcets denote percentage to total sericultural workers in respective district.

Source: Based on primary data.

harvesting as against the others, in which time involved is generally low like marketing. We have collected data from our sample of sericulturist households to investigate as to how much hours are being put in different activities by male and female sericultural workers. This provides us an estimate of employment in terms of mandays according to males, females and total. The total hours of employment across different sericulture activities and average days employment per sericulture worker in the sample districts have been presented in table IV.8.

It is evident that maximum hours are being put in harvesting of leaf by the sericultural workers in all the three districts. The feeding of leaf to worms comes as next sericulture activity, where total hours put are more followed by clening of trays, mounting, harvesting, extending, dusting of R.K.O. and marketing. The total employment hours put by female worker is found to be lesser as compared to male worker in Dehradun. However, female workers have put more hours than males in feeding of worms and cleaning of trays in Saharanpur and in feedng of worms, dusting of lime power, extending and mounting in Solan. In general, it is observed that entire sericulture operation has generated more hours of employment for males than for females in our sample districts of Dehradun, Saharanpur and Solan.

Table IV.8 : Total Employment Hours and Average Employment Days by Male and Female in Different Sericulture Activities

Activities	Dehradun			Saharanpur			Solan		
	Male (No.)	Female (No.)	Total (No.)	Male (No.)	Female (No.)	Total (No.)	Male (No.)	Female (No.)	Total (No.)
1. Harvesting of leaf	22701	16439	39140	14042	10462	24504	14583	11083	25666
2. Feeding	14085	13044	27129	10802	11702	22504	6073	7580	13653
3. Dusting of lime Power	1560	780	2340	4685	1442	6127	355	712	1067
4. Cleaning of trays	11256	9425	20681	10662	9842	20504	2964	2847	5811
5. Extending	5997	4954	10951	8732	9089	17821	2345	2404	4749
6. Dusting of R.K.D.	1563	782	2345	2524	1262	3786	487	366	853
7. Mounting	10438	9654	20092	7215	5411	12626	949	3439	4388
8. Harvesting	10125	8872	19047	3597	2877	6476	4273	3561	7834
9. Stiffling	--	--	--	--	711	711	--	--	--
11. Marketing	3389	2086	5475	711	710	1421	2727	2372	5099
Total	81114	66086	147200	63112	53368	116480	34756	34364	69120
Average employment days in sericulture	86	74	80	69	61	65	58	62	60

Source : Based on primary data.

It is further revealed that sericulture provides average employment of 86 mandays to male workers, 74 mandays to female workers and 80 mandays to all workers engaged in it in Dehradun. In Saharanpur, the average mandays per worker are 69 for males, 61 for females and 65 for both males and females. In Solan, average employment days are 58 for males, 62 for females and 60 for both males and females. Thus, the average mandays employment generated by sericulture is found higher in Dehradun as compared to Saharanpur and Solan. Average employment days for females are, thus, found to be lower as compared with male in Dehradun and Saharanpur. In Solan, however, females employment is found to be marginally higher (62 days) than that of males employment (58 days).

VIII. Perception of Adult Ladies About Participation in Sericulture Activities

Adult ladies of sample sericulturist households were enquired about their perceptions, awareness and contribution in certain important sericulture activities. Answers provided by them are presented in the table IV.9. It is evident that around 95 per cent of adult ladies of Dehradun, participating in sericulture are aware about the quantity of cocoons produced. In Saharanpur, the corresponding percentages come to 79 per cent and in Solan to 25 per cent.

Table IV.9 : Perception of Adult Ladies On Various Aspects of Sericulture Activity in Selected Districts

Particulars	Dehradun			Saharanpur			Solan			Total		
	Yes (No.)	No (No.)	Total (No.)	Yes (No.)	No (No.)	Total (No.)	Yes (No.)	No (No.)	Total (No.)	Yes (No.)	No (No.)	Total (No.)
1. Awareness about the quantity of cocoon production	89 (94.68)	5 (5.32)	94 (100.00)	81 (79.41)	21 (20.59)	102 (100.00)	16 (25.00)	48 (75.00)	64 (100.00)	186 (71.53)	74 (28.47)	260 (100.00)
2. Participation in decision making in relation to:												
(i) Time for selling	-	-	-	-	1	1	1	63	64	1	64	65
(ii) Place where cocoons are to be sold	-	-	-	-	1	1	1	63	64	1	64	65
(iii) Price at which cocoons to be sold	-	-	-	-	1	1	2	62	64	2	63	65
(iv) Use of profit	93 (98.93)	1 (1.07)	94 (100.00)	86 (85.14)	15 (14.86)	101 (100.00)	34 (53.12)	30 (46.88)	64 (100.00)	213 (82.23)	46 (17.77)	259 (100.00)
3. Accumulation of savings from sericulture	16 (16.84)	79 (83.16)	95 (100.00)	15 (14.70)	87 (85.30)	102 (100.00)	11 (20.75)	53 (79.25)	64 (100.00)	42 (16.09)	219 (83.01)	261 (100.00)
4. Willingness to go to the market to sell cocoon	31 (32.97)	63 (67.03)	94 (100.00)	52 (50.98)	50 (49.02)	102 (100.00)	18 (27.27)	48 (72.73)	66 (100.00)	101 (38.54)	161 (61.46)	262 (100.00)
5. Actually went to the market for selling of cocoons	5 (5.20)	91 (94.80)	96 (100.00)	13 (12.74)	89 (87.26)	102 (100.00)	6 (9.37)	58 (90.63)	64 (100.00)	24 (9.16)	238 (8.84)	262 (100.00)
Total	234 (49.47)	239 (50.53)	473 (100.00)	247 (48.24)	265 (51.76)	512 (100.00)	89 (17.31)	425 (82.69)	514 (100.00)	570 (38.02)	929 (61.98)	1499 (100.00)

Source : Based on primary data.

Participation of adult ladies in marketing decisions, such as, when and where to sell is found to be very negligible in case of households in all selected districts. However, there is a high proportion of adult ladies, who have participated intensively in deciding as to how to use profit earned from sericulture. The percentage of such ladies are as high as 99 per cent in Dehradun, 85 per cent in Saharanpur and 53 per cent in Solan. A large number of adult ladies have also informed that they do not have any accumulated savings from the sericulture. Only 17 per cent of adult ladies from Dehradun, 15 per cent from Saharanpur and 21 per cent from the Solan have indicated that they have accumulated savings from sericulture. We further enquired from the adult ladies as to whether they would like to go to market to sell cocoons. Of the total adult ladies, only 33 per cent from Dehradun, 27 per cent from Solan and around 50 per cent from Saharanpur expressed their willingness to go to market for selling of cocoons. We further enquired from adult ladies as to whether they actually go to market for selling the cocoons. The answers given by them are disappointing. It is discovered that only 5 per cent of adult ladies in Dehradun, 13 per cent in Saharanpur and 9 per cent in Solan actually use to go to market for selling of cocoons.

IX. Summing Up:

What transpires from the above analysis carried out in this chapter is that the sericulture activity in the sample districts is not female dominated. The male-female participation in the activity is generally conditioned by the caste-wise participation. The analysis indicates a high incidence of illiteracy among sericulturists in all three sample districts. The employment pattern of sericultural workers denote that sericulture is the prime source of employment in the sample districts. The participation of females in rearing and marketing is found to be more than the males in the aggregate sample. In other activities of silk-worm rearing like ownership, farming and other activities, females participation is lower than males.

The analysis further discusses about the employment in terms of hours and average mandays generated from sericulture in Dehradun, Saharanpur and Solan. It indicates that males work for more hours than females in different sericulture activities in Dehradun district. In Saharanpur and Solan, feeding to worms, dusting of lime powder and extending are the main activities, in which females working hours are more than the males.

Analysis further indicates that sericulture generates employment to 80 mandays in Dehradun, 65 in Saharanpur and 60

mandays in Solan district. Employment for females in terms of days is found to be lesser than of males in Dehradun and Saharanpur, while in Solan, females employment days are found to be marginally higher than the males. Awareness among adult ladies is found quite high about the quantity of cocoons produced in all the sample districts. Most of adult ladies reported that they do not have accumulated savings from sericulture. However, their participation in marketing decisions is found to be negligible. This is confirmed by the responses articulated by adult ladies that they usually do not go to the market to sell the cocoons, although most of them are interested to do this activity.

CHAPTER V

SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

We may now recapitulate the major findings of the study and draw some general conclusions about the socio-economic conditions of sericulturists and non-sericulturists in Dehradun and Saharanpur districts of Uttar Pradesh and Solan in Himachal Pradesh. It will not only sharpen our understanding about the overall functioning of sericulture activity but also help in exploring certain policy directions towards making the sericulture more efficient and productive employment generating activity.

The employment generation strategy has been an integral part of India's economic development process. It emphasised development of large scale industries and small, medium, tiny and khadi and village industries. This was presumed that growth of one kind of industries would stimulate the growth of other and, therefore, industries of all types were treated on 'complementary' rather than on 'competitive' basis. To strengthen 'complementary relationships' among

industries, a package of policy assistance and programmes in India was extended from time to time. Such objective set out in planning process had, however, not been obtained at the desired level. This was due to inbuilt structural economic and non-economic constraints, under which most probably were the well known leakages on the part of government in terms of undesirable regulations and procedures and the overall limitations and constraints inbuilt in the entire Indian industrial system. Gradually, it was realised that one segment of industrial system worked independently with other, which consequently weakened the supply and demand linkages in major industrial categories.

Overtime, it is recognised that employment generation can even be made possible at the different but segmented sectors of Indian economy. Sericulture activity towards this direction provides an ample scope for employment generation. It is basically a seasonal household activity wholly controlled and managed by the households. It gives part-time employment to the members of the household. It makes possible to utilise unused family labour, which, in turn, generates additional income to the household. Since sericulture provides employment and generates income to the households, it would be worthwhile to understand some of the characteristics of households engaged in it and problems faced by this activity.

I. General Characteristics

The examination of general characteristics is based on 64 sericulturist households of Dehradun, 63 of Saharanpur and 80 of Solan, which are disaggregated into four operational land holding classes. It is found that operational land holding is 2.49 acres, while area under mulberry 0.22 acre per household in Dehradun. Corresponding figures are 5.50 acres and 0.63 acre in Saharanpur, while 2.40 acres and 0.24 acre in Solan. A large number of sericulturists i.e., 52 out of 64, in Dehradun, 28 out of 63 in Saharanpur are found having rearing room away from their dwelling unit, and most of them have used rearing room mainly for rearing purposes. This is however, not true in case of Solan, where 61 sericulturists, out of 80, have rearing room adjacent to their dwelling units and 51 sericulturists, out of 80, have used rearing room for other than rearing purposes.

Tray is an essential requirement for cocoon production, which is found to be 50 per household in Dehradun, 28 in Saharanpur and 22 in Solan. Price per tray is worked out at Rs.34 in Dehradun, Rs.29 in Saharanpur and Rs.30 in Solan. Also, those households wanting additional tray are found desirous to obtain the same on purchase basis. Like tray, stand is also an important requirement for cocoon production.

Stand per household is found to be 1 in Dehradun and Solan and 2 in Saharanpur. Price per stand varies across the districts, which is found to be Rs.78.25 in Dehradun, Rs.89 in Saharanpur and Rs.72 in Solan. Similarly, mountage is found to be only 1 per household in each district, though there are marginal variation in terms of price. Price per mountage comes to Rs.13 in Dehradun, Rs.14 in Saharanpur and Rs.12 in Solan. Generally, it is found that tree twigs are also used interchangeably at the place of mountage. Findings thus suggest that essential requirements are the function of volume of cocoon output, while variation in prices of infrastructural requirements is determined essentially by the bargaining capacity of buyers with sellers.

Need for finance is equally important, which affects invariably the production of cocoons. Findings emerging from the study suggest that an overwhelming majority of households depend on their own sources of finance. This is true in all selected districts of Dehradun, Saharanpur and Solan. This is, however, not to stress that sericulturist households are not aware of loan facility available in different commercial and non-commercial banks. As much as 70.32 per cent of households in Dehradun, 73.02 per cent in Saharanpur and 63.50 per cent in Solan are found well aware about the bank loan facility. This would imply that sericulture activity could be well managed within the financial resources of the households themselves. As infrastructural facility and other

requirements tend to determine the overall functioning of sericulture activity, it leads us to examine the level of productivity, income and employment generation and other relevant aspects in proper perspective.

II. Productivity, Income and Employment Generation and Marketing Mechanism

On the basis of estimation procedure discussed in chapter III, sericulture in Dehradun has generated the employment of 1037 persons, while income to the tune of Rs.36.30 lakhs. Cocoon production is estimated to be Rs.36.96 lakhs, while area under mulberry cultivation to 140.56 acres. Based on the actual figures collected from published source, employment is found to be 1043, while area under mulberry cultivation to 235.63 acres. The discrepancy of information particularly on area under mulberry cultivation obtained by us from estimation method and that from published source invites wrath controversy, which can only be resolved by a field based study designed in a new dimension on a census basis.

Based on census method, sericulture provides employment to 224 persons in Saharanpur, while to 144 persons in Solan. Income derived from sericulture comes to Rs.5.71 lakhs in

Saharanpur and Rs.2.88 lakhs in Solan. Production of cocoon comes to Rs.6.16 lakhs in Saharanpur and Rs.2.98 lakhs in Solan. Area under mulberry comes to 39.69 acres in Saharanpur and 19.20 acres in Solan. This also influences the level of productivity, which is found highest in Dehradun in respect of labour, capital, land and input as compared with Saharanpur and Solan. In between, Saharanpur and Solan, labour and capital productivities are higher in the former than in the latter, while in terms of input productivity latter has an edge over the former. Land productivity is found to be almost the same both in Saharanpur and Solan.

Productivity performance also determines the profit. Gross profit is found to be of the order of Rs.8.05 lakhs in Dehradun, Rs.5.71 lakhs in Saharanpur and Rs.2.88 lakhs in Solan. Also, profit per unit is worked out to be Rs.12,578.13 per annum in Dehradun, Rs.9,066.67 in Saharanpur and Rs.3,600 in Solan. Thus, it implies that Dehradun has been the forrunner in sericulture activity vis-a-vis the Saharanpur in the state of Uttar Pradesh and Solan of Himachal Pradesh.

This is, however, not found to be corroborated by the performance of production. Invariably, an overwhelming majority of sericulturists have reported the poor performance of cocoon production in all districts considered. The principal factors for this have been reported to be the

diseases, which are seen to have destroyed the crops of cocoons. As a protective measure, separation of silk worms and application of R.K.O. power are followed, but these are not found sufficient means for protecting the silk worms from diseases. Equally important with this was also the use of obsolete technology, which was either borrowed from neighbours or from the government department. The advanced imported technology either within the country or from outside has not been found in common use by the sericulturists.

As for the marketing, it is underscored that from 79 per cent to 86 per cent of cocoons have been sold to government. A sizeable proportion of sericulturists also realises that they are being harrassed by the government purchasers particularly in terms of offering lower prices, underweighting of cocoons and delay in payment. As a result, most of rearers are highly dissatisfied and they are in a process to discontinue the sericulture activity.

It may be reiterated that sericulture being a household activity, its prospect much depends on its capacity to absorb employment and to generate additional income to the households. Findings emerging from the study suggest that, of the total income of households, income from sericulture constitutes to 28.06 per cent in Dehradun, 15.86 per cent in Saharanpur and 13.03 per cent in Solan. Similarly, of the total household employment, employment generated from sericulture comes to 28.22 per cent in Dehradun, about 30 per

cent in saharanpur and about 28 per cent in Solan. Thus, sericulture appears to be a secondary activity and, therefore, sericulturists are not keen to increase the area under mulberry cultivation. It shows that future of sericulture is not at all bright and encouraging.

Overall impressions gathered from non-sericulturists also support this view. Over 62 per cent to 87 per cent of non-sericulturists feel that sericulture is not at all a profit oriented. Although, land is suitable to sericulture, but due to lack of proper training, it is not possible for them to start sericulture. This is inspite of the fact that non-sericulturists are well aware about the facilities available from the govrenment in terms of training, loan, seed, trays and medicines. In particular, 31.25 per cent of non-sericulturists in Dehradun, 41.80 per cent in Saharanpur and 50 per cent in Solan are well aware about the training facility available from the government. Similarly, 31.25 per cent of non-sericulturists in Dehradun, 23.53 per cent in Saharanpur and 25 per cent in Solan are aware about the loan facility for starting the sericulture. As for the availability of seeds, 18.75 per cent of non-sericulturists in Dehradun, 23.53 per cent in Saharanpur and 12.50 per cent in Solan are aware of this facility, which can be had from the government. Generally, 87.50 per cent of non-sericulturists in Dehradun, 100 per cent in Saharanpur and 75

per cent in Solan are fully aware about the helps of various kinds available from the government. It emerges, therefore, that, irrespective of facilities in various forms, non-sericulturists are not interested to start the sericulture mainly owing to less profit margins and the misconception prevailed in society about sericulture activity.

III. Women in Sericulture: Participation and Perception

Empirical analysis per-se could not examine the contribution of women explicitly, which forms an important part of sericulture activity. This is so because contribution by women has generally been recognised as more significant in traditional mulberry growing states of the country. Chapter IV, therefore, examines above aspects in proper perspectives. General characteristics of women tend to suggest that, of sample of sericulturist households female population constitutes 45.61 per cent in Dehradun, 44.48 per cent in Saharanpur and 43.38 per cent in Solan. Average size of family comes to 4.62 in Dehradun, 5.10 in Solan and 5.46 in Saharanpur. It is further revealed that sericulture activity in Dehradun, Saharanpur and Solan is not dominated by female workers. In Dehradun, female workers account for 48.70 per cent, in Saharanpur 48.66 per cent and in Solan 47.92 per cent. This is in sharp contrast to the belief that

participation by females is more significant than the males. Finding thus suggests an opposite situation prevalent in traditionally sericulture developed states like West Bengal, Karnataka and Mysore.

Study also provides the Caste-wise classification of workers. The proportion of SC/ST workers comes to 63.91 per cent in Dehradun, 69.20 per cent in Saharanpur, and 30.56 per cent in Solan. It emerges that sericulture activity is dominated by SC/ST workers in Dehradun and Saharanpur, while non-SC/ST workers dominate the sericulture activity in Solan. Among SC/ST workers in selected districts, male workers dominate, while female workers among the non-SC/ST workers.

Across different sericulture activities, study finds that 50 per cent of female workers are engaged in rearing and 33.33 per cent in marketing in Dehradun; 80 per cent in marketing in Saharanpur; and 37.50 per cent in rearing in Solan. In sharp contrast to this, 25.62 per cent of male workers are engaged in rearing and 22.11 per cent in marketing in Dehradun; 27.87 per cent and 21.86 per cent in Saharanpur; and 33.88 per cent and 28.67 per cent in Solan. It turns out that main job for women is rearing and marketing in Dehradun, marketing in Saharanpur and rearing in Solan district.

Study further examines critically the average days employment put in different sericulture activities. It is

found that, sericulture generates 80 days of employment in Dehradun, on an average of which, 86 days are accounted for by male and 74 days by female. In terms of hours, around 45 per cent is accounted for by female workers. In Saharanpur, sericulture generates employment to 65 days, of which, 69 days are accounted for by male and 61 by female. In Solan, employment from sericulture comes to 60 days, of which, 62 days are accounted for by female and 58 days by male. Of the total hours of work generated by sericulture, about 50 per cent has been accounted by female workers. It would, thus, imply that sericulture is mainly a seasonal household activity, which provides jobs to women from 2 to 3 months in a year and, therefore, it can and should not be treated as key activity for sericulturist households.

The study further examined about the responses of adult ladies on different aspects of silk worm farming. The 94.68 per cent of adult ladies in Dehradun, 79.41 per cent in Saharanpur and only 25 per cent in Solan are aware about the quality of cocoon production. Similarly, 98.93 per cent of adult ladies in Dehradun, 85.14 per cent in Saharanpur and over 53 per cent in Solan are aware about the use of profit generated from cocoon production. Unfortunately, awareness about accumulation of saving is found to be insignificant as 16.84 per cent of adult ladies in Dehradun, 14.70 per cent in Saharanpur and 20.75 per cent in Solan are aware about it. As for the participation of adult ladies in marketing, study

reveales that about 33 per cent in Dehradun, 51 per cent in Saharanpur and over 27 per cent in Solan are willing to go to market for selling of the cocoons, but in reality, only 5.20 per cent, 12.70 per cent and 9.37 per cent of adult ladies in respective districts have gone to market for this purpose. It may, therefore, be inferred that, irrespective of high awareness on above aspects, adult ladies have not been placed at a respectable and decision making position in sericulture activity in selected districts.

IV. Policy Implications

Findings of the study are not without policy relevance. To the extent level of productivity is lower in Saharanpur and Solan compared with Dehradun warrants attention to the policy makers and researchers. Low productivity in sericulture appears to be the function of poor production performance of cocoons, which, in turn, is an outcome of diseases, use of locally available outdated technology, lack of adequate finance and improper training to the sericulture workers. Given the framework of analysis, it would be advisable and useful if government makes concerted efforts to improve productivity level of sericulture. May be that government should depute sericultural workers from Saharanpur and Solan to Karnataka, Mysore and West Bengal to learn

advanced technique for fighting the diseases and to improve their skills required to enhance the production of cocoons. It may be mentioned that Central Silk Board has already made some efforts towards this direction, but these are not sufficient. More concerted efforts are still required at a continuous basis. Similarly, latest technology available in China needs to be applied in non-traditional mulberry growing districts of Saharanpur and Solan in consideration with their local conditions and factor endowment structure. In Dehradun also the use of latest technology would be more quick result orienting and rewarding.

As for the financial requirement, sericulturists are aware about the financial help available from financial institution, but they do not intend to avail it therefrom. In fact, sericulturists have managed finance independently from their own sources. This manifests the leakages of current financial system including artificial harrassment of sericulturists. This needs to be considered with full care and concern. Attempts are, therefore, required to be made to raise the limit of loan and, if possible, at special discount rate of interest. Equally important would also be to extend the financial help to sericulturists by Central Silk Board at affordable rate of interest. Here, special care needs to be taken so that misuse of funds is avoided. Financial help should, therefore, only be provided to the sericulturists after making strict scrutiny about the feasibility of

requirement and repaying capacity of the potential sericulturists. These efforts per-se will improve the production process and productivity levels simultaneously.

Findings of the study have also underlined the harassment by the government personnel in purchasing of cocoons from the sericulturists. This has been reported by a sizeable number of sericulturists of Dehradun, Saharanpur and Solan. During field investigation, we have been told that government officials have underweighted the cocoons, underrated the quality of cocoons, lowered the price of cocoons and delayed the payment to sericulturists. This calls for immediate attention by Central Silk Board. It would be advisable that top level officials of Central Silk Board should personally visit to sericulturists and enquire about their problems. May be that a committee constituting of sericulturists and top officials of Central Silk Board is appointed to enquire about the marketing problems. Based on recommendations thereupon, government should immediately take appropriate action to remove the marketing problems.

It may be reiterated that a majority of sericulturists is not interested in expanding the sericulture activity. This is in sharp contrast to the fact that facilities in terms of loan, seed, training, etc. are amply made available by the government. Also, non-sericulturists are equally not interested in sericulture, owing to the low profitability and misconceptions usually prevailed in and around their

villages, yet these are endowed in terms of suitable land for growing sericulture. It is often advocated that sericulture is dirty activity with unbearable bad smelling. This calls for urgent actions by Central Silk Board. May be that appropriate various training courses are organised regularly by Central Silk Board to educate sericulturists about the utility of sericulture, to follow cost reducing measures, to understand the various processes of cocoon production and to sort out the marketing problems of cocoons. This will enhance the profitability from sericulture activity. Training courses as suggested may also include the non-sericulturists as well, who should be trained about the various processes of sericulture activities and be made aware about the facilities available from the government for development of sericulture. A special awareness programme for non-sericulturists would likely to wipe out the misconception about sericulture.

Contribution of women is another important dimension of sericulture. Findings of the study suggest that a majority of women are generally engaged in rearing and marketing in Dehradun, marketing in Saharanpur and rearing in Solan. Sericulture also absorbs little half of female work force. It predominantly employs workers from SC/ST community in Dehradun and Saharanpur and from non-SC/ST in Solan. Among the SC/ST, male workers dominate, while female workers among non-SC/ST. Sericulture, as such, provides employment to 74

days for women in Dehradun, 61 in Saharanpur as against the male employment of 86 and 69 days respectively. In Solan female employment is found to be marginally higher than that of male employment. This tends to suggest that there exists ample scope of employment generation for females in sericulture. This could be done by enhancing the scale of cocoon production, reducing the cost of production, by educating sericulturist households to raise female participation and extending special financial incentives linked with productivity.

It may be noted that a package of policy measures suggested for productivity improvement, technological adoption, alternative financial arrangement, training courses, awareness programmes etc. must be treated as temporary device for sericulture development. However, if such policy measures are taken by sericulturists as permanent "stretches", it is advisable that these must be immediately withdrawn. Let the competitive forces determined by supply and demand shape the destiny of seasonal household based sericulture activity.

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